

Chapter 31

LFG and Continental West-Germanic languages

Gerlof Bouma

University of Gothenburg

1 Introduction

This chapter is concerned with the Lexical-Functional Grammar treatment of the present-day West-Germanic languages *sans* English or Scots. This group is sometimes referred to as Continental West Germanic (Zwart 2008), as it is mostly comprised of Germanic languages¹ spoken in countries on the European mainland: from Belgium and the Netherlands, through Luxembourg and Germany, to Switzerland, the northernmost parts of Italy, and Austria; and in addition in smaller regions bordering these countries. In spite of the label ‘continental’, the group of Continental West Germanic languages (henceforth: CWG) also contains languages like Yiddish (spoken in Israel, North America and elsewhere), Afrikaans (South Africa and Namibia), Dutch in the Antilles and Suriname (in terms of language politics part of the same standardization body as Belgium and the Netherlands), and German heritage variants in the Americas (Putnam 2011) and Siberia (Andersen 2016), to name but a few group members outside of continental Europe.

¹Unless it is relevant to the discussion, I will use the term *language* in a broad sense that ignores matters like the language/language variety/regiolect/dialect/etcetera’s political status, whether a language label covers a homogeneous or heterogeneous group of subvarieties, or whether it is mutually intelligible with languages that do not fall under the same label.

In terms of L1 speakers, the largest of these languages are the standard varieties of German and Dutch, with circa 75 and 25 million speakers, respectively.² Their status as standardized national languages in multiple countries also means they are supported by strong academic infrastructures. It is therefore not surprising that most of the work on CWG in LFG is done on these two languages. Standard German and Dutch³ will figure prominently in this chapter. This is merely a reflection of their salience in the LFG literature, and should not be interpreted linguistically, for instance as a sign of them being more typical CWG languages than other members of the language group.

A comprehensive inventory of West-Germanic languages with demographic and linguistic information can be found in *Ethnologue*⁴ (Eberhard et al. 2019). Bibliographic data on West-Germanic can be found in *Glottolog*⁵ (Hammarström et al. 2019). Note that neither of these resources distinguishes a CWG branch in their taxonomies. For an overview of the syntactic traits of Continental West Germanic, I refer the reader to Zwart (2008). An accessible description of how German is syntactically different from English and from the North-Germanic languages can be found in the introductory chapters of Haider (2010), with arguments that in many cases carry over to the other CWG languages.

1.1 A general picture of Continental West Germanic, with a focus on the clause

In this subsection we will discuss some of the syntactic traits of CWG. Our focus will be on the clause/verbal domain, since this has been the main interest of the LFG literature on CWG. We will discuss the nominal domain more briefly. The purpose of this subsection is twofold. First, it gives a very general impression of CWG syntax and indicates how it differs from its North- and West-Germanic neighbours. Secondly, it introduces some of the language-particular background needed to understand the individual LFG analyses discussed in the rest of the chapter.

1.1.1 Clause layout

A prominent syntactic feature of CWG languages is the combination of *asymmetric verb second* together with *verb final* (Zwart 2008; Haider 2010). The former

²Counts based on Eberhard et al. (2019).

³Unless the context requires otherwise, I will use *German* and *Dutch* without further modification to refer to the standardized, national language varieties of these two CWG languages.

⁴<https://www.ethnologue.com/subgroups/west-0>, consulted July 2022

⁵<https://glottolog.org/resource/languoid/id/west2793>, consulted July 2022

label characterizes a clause structure in which the finite verb in main clauses, but *not* in subordinate clauses, is preceded by exactly one constituent, which can have a wide range of grammatical functions. The latter label covers the generalization that any verbal material that is not in second position – finite verbs in subordinate clauses and non-finite verbs in general – clusters together towards the end of the clause, potentially following arguments and adjuncts. As such, CWG contrasts with Modern English, which lacks both pervasive verb second in main clauses and verb finality, and follows a more rigid subject-verb-complement order. CWG also differs from the present-day North-Germanic languages, which can be characterized as combining verb second with subject-verb-complement order.⁶

For the discussion of the layout of a CWG clause, it is helpful to make use of the so-called *topological field model* of the clause, which can be found in traditional descriptions of German and Dutch and in reference grammars like Zifonun et al. (1997) and Haeseryn (1997). In this model, the layout of a clause is described in terms of linearly ordered fields, and different word order variants associated with different clause types are obtained by assigning constituents to different fields. The field schema we use in this chapter is given in (1).

- (1) lead || Vorfeld | left bracket | Mittelfeld | right bracket | Nachfeld || tail

In a main clause, the *left bracket* (lb) and *right bracket* (rb) are reserved for verbal material: a single, second-position finite verb is in the left bracket, and any other verbs are in the verb cluster in the right bracket. Between the brackets there is the *Mittelfeld* ‘middle field’ (Mf), which may contain any number of constituents. The *Vorfeld* ‘prefield’ (Vf) is the designated place for the single constituent preceding the finite verb, whereas the *Nachfeld* ‘postfield’ (Nf) may contain several items, and is typically reserved for heavier constituents like clausal arguments, extraposed relative clauses and adverbial prepositional phrases. The *lead* and *tail* fields⁷ host material that is more loosely connected to the clause, such as

⁶Two remarks are in order with respect to this characterization of CWG clause layout. First, as it can be used to demarcate CWG from English as well as from North-Germanic, it gives some linguistic substance to the pooling of CWG languages into one group, as we do in this chapter. Secondly, and somewhat weakening the first point, once we start to look closer at individual CWG languages, we find deviations from the general pattern. Modern Yiddish in particular fits the description poorly, both in terms of the verb-second pattern and the verb-final pattern. It is beyond the scope of this chapter to go into all the exceptions, but some of them will be discussed towards the end of this section and in the context of LFG analyses of these exceptions.

⁷The terminology around these last two fields is not as established as for the fields that are part of the clause proper. The lead is for instance also known as *Vorvorfeld* ‘pre-prefield’ or *linkes Außenfeld* ‘left outfield’, and the tail as *Nachnachfeld* ‘post-postfield’ or *rechtes Außenfeld* ‘right outfield’.

vocatives and hanging topics. Note that not every field needs to contain material. Examples of different declarative main clause types are given in (2).

(2) Dutch

a. Subject-initial declarative:

Vf——— lb— Mf——— rb———
De draken doen Doris dadelijk duizelen.
the dragons make.PRS.PL Doris immediately feel.dizzy.INF
'The dragons immediately make Doris feel dizzy.'

b. Object-initial declarative:

Vf— lb— Mf——— rb———
Doris doen de draken dadelijk duizelen.
Doris make.PRS.PL the dragons immediately feel.dizzy.INF

c. Sentence adverb-initial declarative:

Vf— lb— Mf——— rb———
Dadelijk doen de draken Doris duizelen.
immediately make.PRS.PL the dragons Doris feel.dizzy.INF

The verb-second constraint is clear here: the finite verb is always in the left bracket and precedes its subject if a non-subject is in the Vorfeld (2b,c). The subject and object can appear in identical positions – contrast the OVS order in (2b) with SVO in (2a). Linear order is therefore not fully determined by grammatical function, or vice versa. The Vorfeld is also the target of long-distance dependencies, like fronting of *wh*-constituents out of embedded clauses (not shown here). The Mittelfeld may contain a collection of (nominal) arguments and (simple) adverbials, which are typically local to the clause. The extent to which the order of material within the Mittelfeld is fixed differs between languages (see Section 2.4.1). Grammatical-function assignment under word order variation, long-distance dependencies, and the order of elements in the Mittelfeld are all basic CWG phenomena that the LFG models discussed below must address.

Other clause types have empty Vorfeld regions, such as the polar interrogative (3a), which is a verb-first construction, and the subordinate clause (3b), in which the left bracket is filled by the complementizer.

(3) Dutch

a. Polar interrogative:

lb— Mf——— rb———
Doen de draken Doris dadelijk duizelen?
make.PRS.PL the dragons Doris immediately feel.dizzy.INF

b. Subordinate:

| | | |
|--------|------------------------------------|----------------------------|
| lb- | Mf————— | rb————— |
| ...dat | de draken Doris dadelijk | doen duizelen. |
| | COMP the dragons Doris immediately | make.PRS.PL feel.dizzy.INF |

Example (3b) has the finite verb in the right bracket, in the verb cluster. This shows the asymmetry of the verb-second phenomenon: unlike in a main clause, the finite verb in a subordinate clause can be preceded by any number of constituents in the Mittelfeld. The topological model accommodates the complementary distribution of the finite verb of a main clause and the complementizer of a subordinate clause by locating both in the left bracket.

The right bracket in (3b) contains two verbs: first the finite verb, then the non-finite verb. This is considered to be the default order in Standard Dutch, but there is considerable variation in this ordering, both between and within CWG languages. An extensive overview of ordering possibilities in CWG verb clusters is given in Wurmbrand (2004).

The topological schema based on the combination of verb second and verb final is widely applicable to the CWG languages, but, as with any generalization, there are cases where it does not apply. To start, we must keep separate the notion of main clause vs. subordinate clause *word order* from the notion of unembedded and embedded clause *uses*. This is because German, amongst others, allows embedded clauses to have verb second under bridge verbs in the absence of a complementizer (see Section 2.2.1); that is, it allows main clause word order for certain embedded clauses. Furthermore, the separation of non-verbal material in the Mittelfeld and verbal material in the right bracket is not always as clean as the topological model suggests, as languages may allow for material from the two fields to be mixed, blurring the border between them (see Section 2.1.2). Finally, Afrikaans and Yiddish have clause structures that deviate further. Spoken Afrikaans optionally allows the combination of a complementizer and verb second in subordinate clauses (Biberauer 2009). Modern Yiddish has verb second in main as well as in subordinate clauses, and in addition its status as a verb-final language is debated (Diesing 1997). Historical stages of Yiddish did however follow CWG's characteristic pattern more closely (Santorini 1992).

1.1.2 Clause union

The examples in (2) and (3) each contain two verbs. We have discussed the topological model as a schema of the clause, without questioning whether we are dealing with mono-clausal structures here. Since Bech (1955/7), it is common

to distinguish between *coherent* and *incoherent* verb combinations. The former describes a combination of two verbs into a single clause, *clause union*, whereas the latter results in a biclausal structure. The contrast is illustrated below. In (4a), the coherently combining *durfde* ‘dared’ shares the verb cluster with its embedded verb *te kopen* ‘to buy’, and the embedded object sits in the Mittelfeld of the clause headed by *durfde*. Example (4b) contains the incoherently combining *beloofd* ‘promised’, and here we see that both the embedded verb and its object appear after the matrix verb, in the Nachfeld of the matrix clause. As shown in (4c), this word order is not available for the coherently combining *durfde* ‘dared’.

(4) Dutch

- a. lb—— Mf———— rb————
 ...omdat hij geen auto durfde te kopen.
 because he no car dared buy.TEINF⁸
 ‘...because he didn’t dare to buy a car.’
- b. lb—— Mf rb—— Nf————
 ...omdat hij beloofde geen auto te kopen.
 because he promised no car buy.TEINF
 ‘...because he promised not to buy a car.’
- c. * ...omdat hij durfde geen auto te kopen.
 because he dared no car buy

The second sign that we are dealing with one clause in (4a) and two in (4b) is the scope of the negation, as evident from the translations. In both examples, negation is marked on the embedded object through the negative determiner but it nevertheless scopes over the finite verb in (4a). The same negation marking in the biclausal (4b) yields a narrow scope negation.

A third phenomenon associated with clause union is the potential to trigger *infinitivus pro participio* (IPP; German: *Ersatzinfinitiv* ‘replacement infinitive’). IPP refers to the realization of a verb in the infinitive when a participle is expected on the basis of the selecting auxiliary. For this to occur, the clause itself must also contain a further, lower verb in the infinitive.⁹ The occurrence of IPP is therefore evidence of the middle and lower verb combining coherently. Below, IPP is triggered in (5a), affecting the coherently combining *durven* ‘dare’, but not in (5b) for the incoherently combining *beloofd* ‘promised’.

⁸The abbreviations TEINF and ZUINF in the glosses are used for the verb forms in Dutch and German that combine the infinitive marker (*te* in Dutch, *zu* in German) with an infinitive. Unlike corresponding forms in for instance English, these combinations are generally not separable.

⁹Further conditions may apply, for instance on the order of the auxiliary and the middle verb.

(5) Dutch¹⁰

- a. Hij heeft geen auto {durven / *gedurfd} te kopen.
 he has no car dare.INF dare.PTCP buy.TEINF
 ‘He didn’t dare to buy a car.’
- b. Hij had {beloofd / *beloven} geen auto te kopen.
 he had promise.PTCP promise.INF no car buy.TEINF
 ‘He promised not to buy a car.’

Example (5a) additionally shows that a clause can contain more than two verbs. In principle, there is no limit to the number of verbs involved in clause union, since the same couple of coherently combining verbs can appear at multiple levels of embedding.¹¹

A wide range of verbs allow for coherent combination. For instance, for Dutch, the reference grammar Haeseryn (1997) lists over 100 verbs that always combine coherently, and an additional 20 that do so optionally. In this list we find auxiliaries; evidential, modal and aspectual verbs; but also verbs with a clearer lexical contribution such as causal and perceptual verbs, and for instance verbs corresponding to *help*, *learn*, *try* or *forget*. In theoretical syntactic work, combining behaviour is commonly taken to be an underived, lexical property of the embedding verb, but see Cook (2001) for an explanation of coherence in German in terms of information structure.

1.1.3 Crossing dependencies

When we have coherently combining verbs that also introduce their own object, we can end up with a clause in which a sequence of objects in the Mittelfeld is followed by a corresponding sequence of verbs in the cluster. In languages like German or West Frisian, the unmarked order of the objects is by increasing order of embedding $O_1O_2\dots O_n$, whereas the order of verbs is by decreasing order of embedding $V_n\dots V_2V_1$. This gives rise to a pattern of nested dependencies between the objects and their verbs (6).

¹⁰A note on the use of brackets and parentheses in examples in this chapter: I will use curly brackets to indicate choice. The choice is either between several forms in one position, such as in the current example (5), or between several positions for one form, such as in the example in (28). Square brackets delimit constituents when this is relevant, such as in (6). Parentheses indicate optionality as usual.

¹¹In practice, it seems that three-verb combinations are common, but more complex clauses are rare. For instance, Coussé & Bouma (2022) report numbers for a mixed corpus of written and spoken Dutch: about 3% of coherence domains contain three verbs, but only 0.1% contain four verbs.

(6) Standard German

O₁ O₂ V₂ V₁

...dass wir [dem Hans] [das Haus] streichen halfen
 COMP we the.DAT Hans the.ACC house paint helped
'...that we helped (V₁) Hans (O₁) paint (V₂) the house (O₂)'

In Dutch and Swiss German, however, objects and verbs can *both* be ordered by increasing level of embedding O₁O₂...O_n and V₁V₂...V_n. This creates cross-serial dependencies between objects and verbs, as in (7).

(7) Swiss German (Shieber 1985: §2, example 1)

O₁ O₂ V₁ V₂

...das mer [em Hans] [es huus] hälfed aastrichte.
 COMP we the.DAT Hans the.ACC house helped paint

The phenomenon of cross-serial dependencies has received ample interest in the literature, because it requires more than context-free power to model (Bresnan et al. 1982; Pullum & Gazdar 1982; Shieber 1985).

1.1.4 In and around the nominal domain

We end the overview of CWG syntax by briefly discussing the main characteristics of the nominal domain and, even more briefly, adpositions. This is to give a general sense of what these domains look like in CWG languages. Most of what is discussed below resembles what we find in the North-Germanic languages and English.

The nominal domain in CWG generally follows a determiner–adjective–noun pattern, with further adnominal material (relative clauses, PPs, etc.) realized post-nominally. This is exemplified in (8).

(8) Dutch

de mooiste plek van Europa
the beautiful.SUPERLATIVE place of Europe
'the most beautiful place in Europe'

Present-day CWG languages have at most four cases (NOM, GEN, DAT and ACC; for example Standard German), but many make fewer case distinctions (see Kasper 2014 for a compact description of the situation in German varieties and references), and several have only a subject-object form distinction remaining in the pronominal paradigm (for example, Afrikaans, Dutch, and West Frisian).¹² There

¹²See taalportaal.org for linguistic descriptions of Afrikaans, Dutch, and West Frisian. Consulted September 2022.

are two numbers (SG, PL). Any of three genders (M, F and N; Alemannic¹³, Low Saxon,¹⁴ Standard German, West Flemish), two genders (COMMON gender and N; Dutch, West Frisian) or no distinction (Afrikaans) may occur. Gender agreement distinctions only show up in the singular. The different paradigm sizes with respect to gender are illustrated in (9). Note the form contrasts in the definite determiners.

- (9) a. Alemannic
 d Frau dr Maa s Chind
 the.F.NOM woman the.M.NOM man the.N.NOM child
- b. West Frisian
 de frou de man it bern
 the.COMMON woman the.COMMON man the.N child
- c. Afrikaans
 die vrou die man die kind
 the woman the man the child

Adjectives can be associated with multiple inflectional paradigms – see Section 3.2.2 for a discussion of these *declension classes* in Standard German. Even in languages with more elaborate paradigms, there is typically a great level of syncretism between forms across inflectional dimensions for determiners, pronouns, adjectives and nouns. The consequences of syncretism for grammatical modelling are discussed in Section 3.2.4.

Adpositions are overwhelmingly prepositional (10a), but the sporadic postposition (10b) and circumposition (10c) occur as well.

- (10) Gronings (Low Saxon)
- a. **op** de grîns
 on the border
 ‘on the border’
- b. t haile joar **deur**
 the whole year through
 ‘the whole year through’

¹³The term Alemannic (German) covers amongst others Alsace German, Swabian and Swiss German.

¹⁴Low Saxon is used interchangeably with Low German by some authors. Our use of the term here comprises regional languages of the north of Germany and the east/north-east of the Netherlands. Our choice for the term Low Saxon is partly driven by the fact that LFG work on this language uses this term: see Section 3.2.1.

- c. **om** de provìnzie **tou**
around the province around
'around the province'

1.2 Overview of the rest of the chapter

Thus far, I have talked about the geographic distribution and the syntactic characteristics of the Continental West-Germanic languages, to define the scope of the chapter, and to give a background for what is to come below.

The remainder of this chapter is devoted to LFG analyses of different aspects of CWG syntax. In Section 2, I discuss LFG accounts of the clause and the verbal domain, and in Section 3, I discuss LFG studies of the nominal domain. These sections are structured in a parallel fashion: they start with analyses of the overall structure of their respective domains, and then continue with a discussion of more specific LFG accounts organized by topic. In the LFG literature on CWG, the clausal and verbal domains have received by far the most attention, which means that the corresponding section dominates this chapter in terms of size.

The chapter ends with concluding remarks in Section 4, in which I briefly touch upon some LFG and LFG-related work that was not included in detail here, and give pointers for further reading.

2 LFG analyses in the clausal and verbal domains

This section deals with phenomena at the level of the clause. I will start in Section 2.1 with a discussion of the variety of ways in which the overall shape of the clause has been modelled, mostly in terms of c-structure. I then look at specific topics that have been prominent in the LFG literature on CWG languages. The topics are divided into thematic sections. Phenomena at the left and right periphery are discussed in Section 2.2 and Section 2.3, respectively. Studies dealing with the ordering of dependents are discussed in Section 2.4. Finally, mapping-based analyses of areas of CWG clause syntax are presented in Section 2.5.

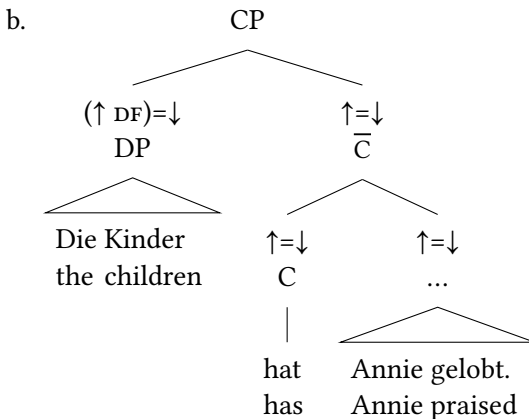
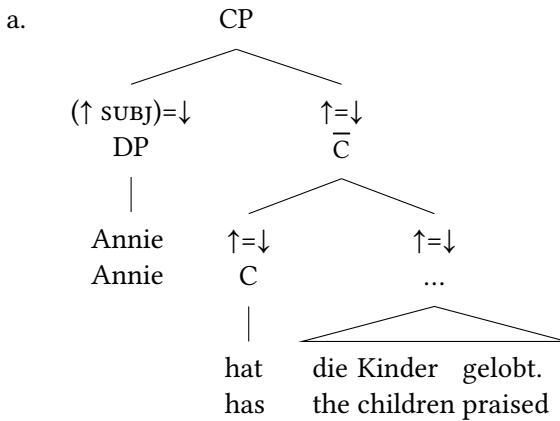
2.1 The overall shape of the clause

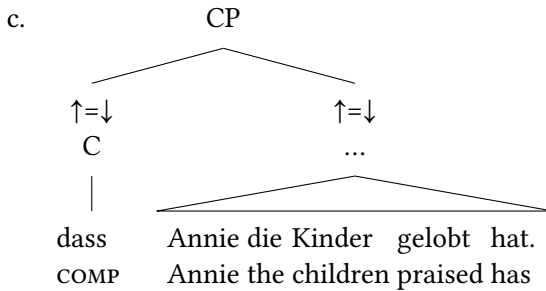
The discussion of the different LFG conceptions of the overall shape of the clause is organized according to the topological field model. I first consider the top level of the clause (directly containing the Vorfeld and left bracket) in Section 2.1.1, and then the lower level of the clause (the Mittelfeld and right bracket) in Section 2.1.2. The Nachfeld is discussed in Section 2.1.3.

2.1.1 Vorfeld and left bracket

Berman & Frank (1996), Choi (1999), Berman (2003), and Frank (2006) model the German verb-second clause as a CP. The finite verb sits in C irrespective of whether the initial position is occupied by the subject of a declarative clause (11a) or by some other element, like the object in (11b). The complementary distribution between the finite verb and the complementizer in the left bracket follows as well: the complementizer can only appear in C, and when it is realized, the finite verb must occur in another, lower position (11c).

(11) German

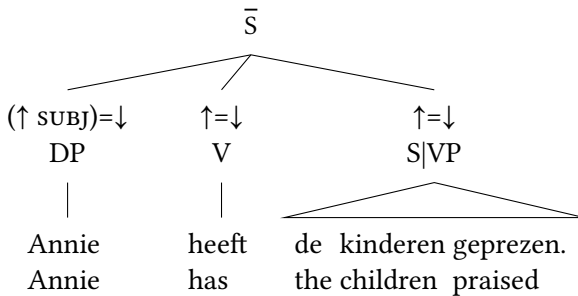




The nature of Comp-CP, the node dominating the combined Mittelfeld and right bracket, differs between these authors, however, and will be discussed below. Van der Beek (2005) and Jones (2020), on Dutch, consider only main clauses, which they posit to be IPs.

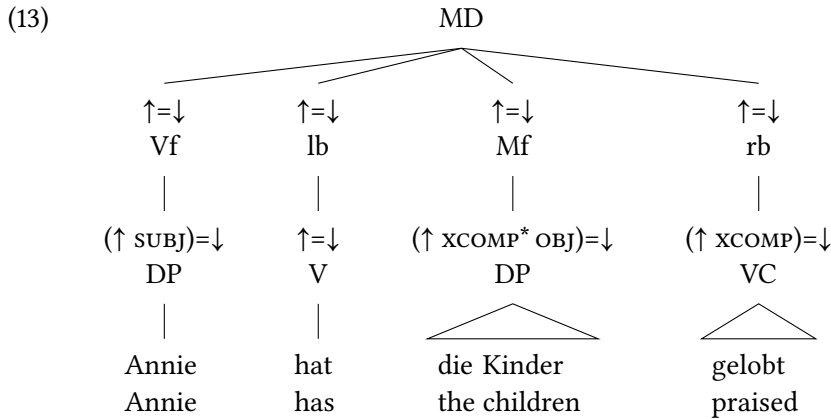
Zaenen & Kaplan (1995, on Dutch; 2002 on German) prefer a slightly flatter structure, exemplified in (12). The label ‘S|VP’, a convention from the cited papers, is used to show that the authors do not wish to choose between these categories.

(12) Dutch



Zaenen & Kaplan’s subordinate clauses are isomorphic to those in (11c), but are labelled \bar{S} instead of CP.

An even flatter structure appears in the computational grammar fragment discussed in Clément et al. (2002), who model the topological field schema directly in LFG. All topological fields are c-structure nodes and direct descendants of the MD node (‘main domain’) that represents the whole sentence. Example (13) gives a somewhat simplified tree, using the abbreviations for the topological fields which I introduced in Section 1.1.1.



A very similar flat structure can be found in Rohrer (1996).¹⁵

2.1.2 Mittelfeld and right bracket

The Mittelfeld and right bracket form the lower c-structure level in the clause. This is the unlabelled Comp-CP in (11) and the S|VP node in (12). All authors agree that this part of the tree does *not* involve an IP.¹⁶ This choice against an intermediate IP can also be found in analyses of German in the Chomskyan tradition, for instance in the line of work summarized in Haider (2010: see §2.2 therein for an overview of the arguments).

A salient question in the analysis of this part of the clause is the order of the verbs and the arguments, and the concomitant contrast between nested versus cross-serial dependencies. We will focus first on the two polar opposites: verbs ordered after increasing level of embedding (cross-serial dependencies) and verbs ordered after decreasing level of embedding (nested dependencies). The following pair, a variation on (6–7) above, illustrates the difference with three verbs in the verb cluster:

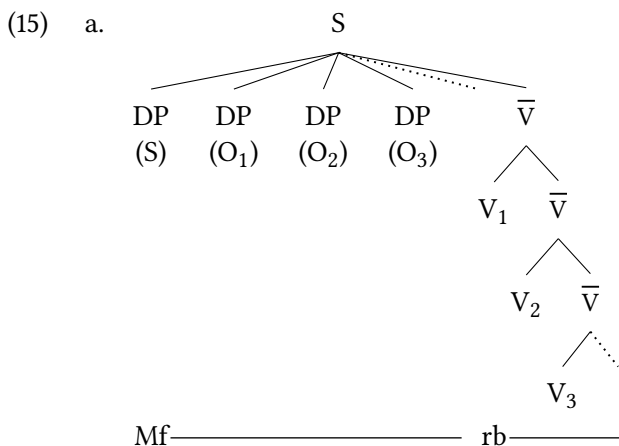
¹⁵Rohrer (1996), however, also writes “Diese flache Struktur lässt sich problemlos in eine binäre rechtsverzweigende Struktur umwandeln. [...] Wir behalten das flache Mittelfeld hier primär aus expositorischen Gründen bei” (p96, fn 3). [This flat structure can be converted to a binary right-branching structure without problems. We maintain the flat Mittelfeld here primarily for reasons of exposition.]

¹⁶In fact, in LFG, the assumption of an IP anywhere in CWG c-structure is rare. We mentioned Van der Beek (2005) and Jones (2020), on Dutch, who use it as the category at the top level, for the whole V2 declarative clause. The choice is not further motivated in these works, and moreover it is peripheral to the respective discussions. Bresnan et al. (2016) posit that Comp-CP contains an IP in one of the book’s exercises on German. However, since this is a textbook, it is unclear whether the authors are theoretically committed to this choice, or whether it was made for other reasons, for instance pedagogical ones.

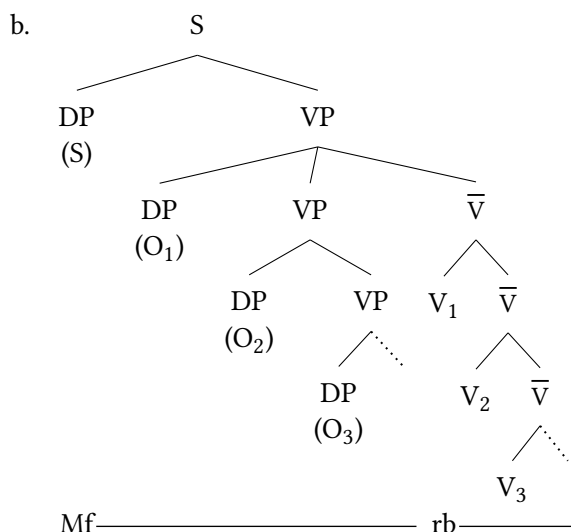
- (14) a. Standard German
 ...dass wir [die Kinder] [dem Hans] [das Haus] streichen
 COMP we the.ACC children the.DAT Hans the.ACC house paint
 helfen lassen
 help let
 ‘...that we let the children help Hans paint the house.’
- b. Swiss German (Shieber 1985: §2, example 5)
 ...das mer [d’ Chind] [em Hans] [es huus] lönd
 COMP we the.ACC children the.DAT Hans the.ACC house let
 hälfe aastriiche.
 help paint.

As mentioned in the introduction, there is considerable variation in the order of the verbal elements beyond these two opposites, and there is even variation in the extent to which the nominal material in the Mittelfeld and verbal material in the right bracket is kept separated, both between and within CWG languages. This variation will be briefly discussed at the end of this subsection.

2.1.2.1 Cross-serial dependencies An early LFG analysis of Dutch cross-serial dependencies is found in Bresnan et al. (1982), which was a prominent demonstration of how LFG’s formalism has the power needed for linguistically valid analyses of such dependencies.¹⁷ Starting from a proposal by Evers (1975), schematically in (15a), with a flat Mittelfeld and a right-branching verb-cluster, Bresnan et al. argue that a structured Mittelfeld is to be preferred, as in (15b).



¹⁷The paper played a central role in the discussion of the context-freeness of natural language syntax. See e.g. Pullum & Gazdar (1982) and Shieber (1985) for more discussion of the issues involved and the kind of evidence considered.



The tree in (15b) contains two parallel embedding structures: one for the objects in the Mittelfeld and one for the verbs in the right bracket. This is captured in the c-structure definitions in (16).

- (16) a. S → DP VP
 (↑ SUBJ)=↓ ↑=↓
- b. VP → $\left(\begin{array}{c} \text{DP} \\ (\uparrow \text{OBJ})=\downarrow \end{array} \right) \left(\begin{array}{c} \text{VP} \\ (\uparrow \text{XCOMP})=\downarrow \end{array} \right) \left(\begin{array}{c} \bar{V} \\ (\uparrow)=\downarrow \end{array} \right)$
- c. \bar{V} → V $\left(\begin{array}{c} \bar{V} \\ (\uparrow \text{XCOMP})=\downarrow \end{array} \right)$
 ↑=↓

For the objects, each level of VP embedding adds a level of xCOMP embedding at f-structure. For the verbs, each level of \bar{V} embedding does the same. A compatible stacking of xCOMPS is thus built up in both parts of the tree. The optionality of the object DP in (16b) allows for verbs that do not introduce their own object. It is essential that an xCOMP level is introduced for these in both parts of the tree, too, to maintain the parallel structure.

The accusative with infinitive verbs involved in the cross-serial construction are analyzed as raising-to-object verbs. The inflected verb form *zag* ‘saw’, for instance, receives a lexical entry along the lines of (17).

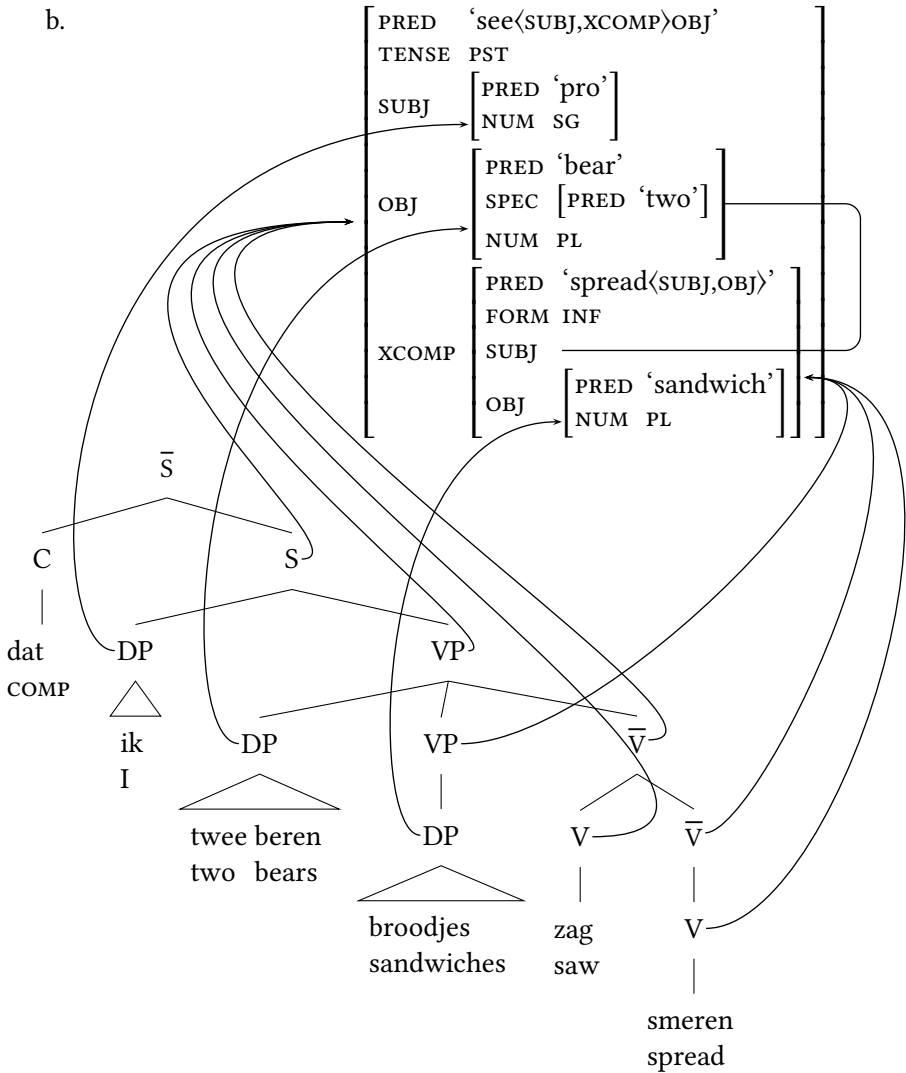
- (17) *zag* V (↑ PRED)=‘see⟨SUBJ,XCOMP⟩OBJ’
 (↑ XCOMP SUBJ)=(↑ OBJ)
 (↑ XCOMP FORM)=INF
 (↑ SUBJ NUM)=SG
 (↑ TENSE)=PST

Complemented with rules for DPs and additional lexical entries, this grammar fragment gives us analyses like the one in (18).

(18) a. Dutch

S O₁ O₂ V₁ V₂
 ...dat ik [twee beren] broodjes zag smeren.
 COMP I two bears sandwiches saw spread

'...that I saw (V₁) two bears (O₁) prepare (V₂) sandwiches (O₂).'



However successful in capturing cross-serial dependencies, this analysis runs into descriptive problems if taken more generally as a model of the Dutch sentence. Zaenen & Kaplan (1995) give the example in (19), which involves the coordination of two \bar{V} s that each require a different level of xCOMP embedding for the object supplied in the *Mittelfeld*.

- (19) Dutch (Zaenen & Kaplan 1995: §2.3, example 9)
 ...dat Jan een liedje [[\bar{V} schreef] en [\bar{V} trachtte [\bar{V} te verkopen]]].
 COMP Jan a song wrote and tried sell.TEINF
 ‘...that Jan wrote and tried to sell a song.’

Since different levels of xCOMP embedding of the object correspond to different c-structures in the model of Bresnan et al. (1982), example (19) cannot receive an analysis if we use the standard treatment of constituent coordination in LFG. It would require the shared material to receive two different c-structures at the same time. Zaenen & Kaplan’s (1995) alternative relies on functional uncertainty to connect the objects to predicates at the required level of xCOMP embedding, and on functional precedence rules to make sure that the linear order of objects reflects their level of embedding. They replace the VP and \bar{V} rules of (16) with those in (20).

- (20) a. VP \rightarrow DP* \bar{V}
 (\uparrow xCOMP* OBJ)= \downarrow \uparrow = \downarrow
 b. \bar{V} \rightarrow V \bar{V}
 \uparrow = \downarrow $\left(\begin{array}{c} \bar{V} \\ (\uparrow \text{xCOMP})=\downarrow \\ \neg((\uparrow \text{xCOMP}^+ \text{OBJ}) <_f (\uparrow \text{OBJ})) \end{array} \right)$

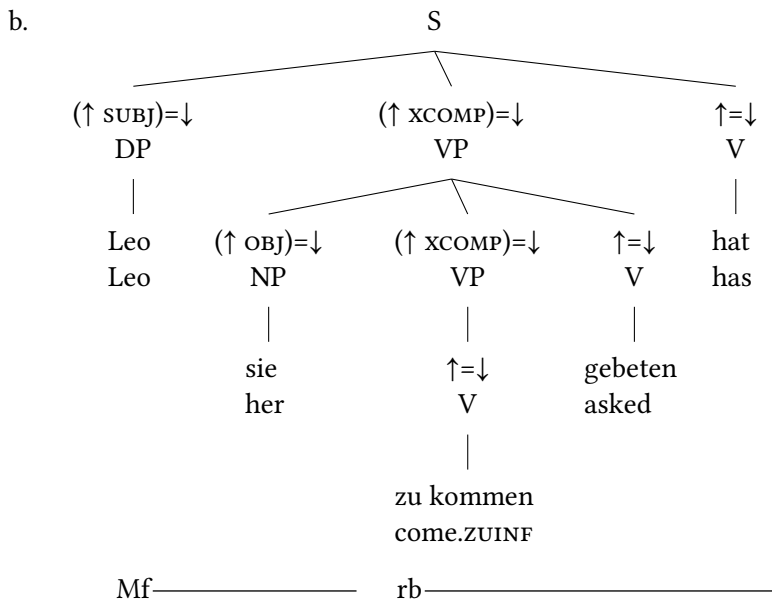
This analysis abandons the nested c-structure of the VP in favour of a flat one, which moves us back in the direction of (15a). The functional uncertainty equation on the object DP in (20a) allows connecting the object to a predicate at any depth of xCOMP embedding, and the general principles of f-structure coherence and completeness make sure each object is matched to exactly one predicate. The functional precedence constraint on the \bar{V} node in (20b) prevents more embedded objects from preceding less embedded ones. Together, these f-structure constraints force the same relation between *Mittelfeld* objects and right bracket verbs as the c-structures subtrees in Bresnan et al.’s analysis. Moreover, the interaction between functional uncertainty and the standard LFG approach to constituent coordination lets us handle sentences like (19) correctly.

Zaenen & Kaplan (1995) also apply the combined use of functional uncertainty and functional precedence to Zürich German, where cross-serial dependencies are observed as well.

2.1.2.2 **Nested dependencies** The analyses of the structures that would give rise to consistently nested dependencies all come from LFG work on Standard German. However, explicit discussion of constructions with multiple objects at different levels of embedding is rare in this part of the literature – perhaps because the modelling of these dependencies is not seen as particularly problematic. We therefore do not always fully know how the relevant nested dependencies are to be derived in these LFG models.

Some authors assume nested VPs, which rather naturally correspond to nested dependencies between objects and verbs, even when this consequence is not a central concern. One example is the grammar fragment of Netter (1988), who gives annotated c-structures like the one in (21).

- (21) a. German (Netter 1988: §1, example C4)
 ...dass Leo sie zu kommen gebeten hat.
 COMP Leo her come.ZUINF asked has
 ‘...that Leo asked her to come.’

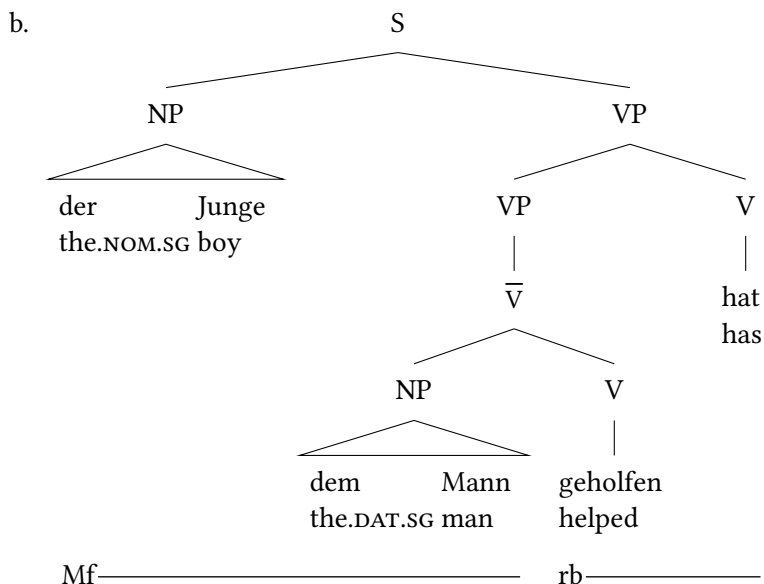


We also find nested VPs in Choi (1999), where the combined Mittelfeld and verb cluster of the subordinate clause in (22a) would get the structure given in (22b).¹⁸

¹⁸Choi (1999) does not provide a tree for this exact sentence, but does show a more complex example with a comparable structure. In addition, Choi (1999) never explicitly motivates the specific c-structure associated with embedded verbs in the VP. Nevertheless, we can infer the structure given here from the examples and discussion there.

(22) German

- a. ...dass der Junge dem Mann geholfen hat.
 COMP the.NOM.SG boy the.DAT.SG man helped has
 ‘...that the boy has helped the man.’



In addition to a nested VP structure, the tree in (22b) shows the subject appearing in S and the object inside the VP. Any deviations from the canonical word order implied by this structure are modelled using optional adjunction of objects to higher positions. Choi (1999) motivates this partially configurational structure for German by appealing to contrasts like the following: a verb and its object can be realized together in the Vorfeld (23a), whereas – it would appear – a verb and its subject cannot (23b).

(23) German(Choi 1999: §2.1, example 12)

- a. [Dem Mann geholfen] hat der Junge.
 the.DAT.SG man helped has the.NOM.SG boy
 ‘Help the man, the boy did.’
- b. * [Der Junge geholfen] hat dem Mann.
 the.NOM.SG boy helped has the.DAT.SG man

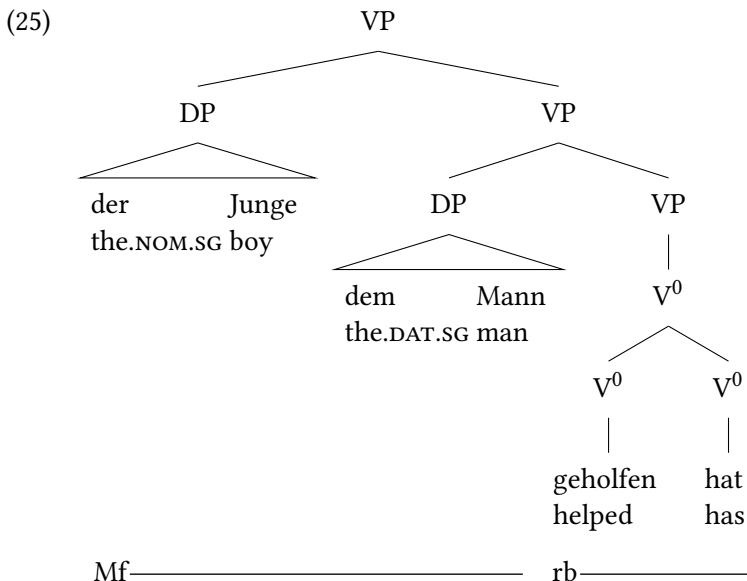
Under Choi’s analysis, this contrast follows straightforwardly by assuming that a VP, unlike an S, can be put in the Vorfeld.

These analyses with nested VPs, which in principle could directly yield the pattern of nested dependencies we find in German, do *not* have a single node containing the whole right bracket and nothing else. Put differently, they do not include the verb cluster as such. This contrasts with the analyses we saw for the cross-serial dependency languages (Dutch, Zürich German) above, where the verb cluster exactly matched a \bar{V} node.

Proposals for Standard German that have a c-structure node corresponding to the verb cluster do exist in the LFG literature. One prominent such proposal is made by Berman (2003), who rejects Choi's claim that the German VP includes the object but excludes the subject, on the basis of data like (24), which, in contrast to (23b), is a successful example of Vorfeld realization of a verb with its subject.

- (24) German (Berman 2003: §3.2.3.2, example 28a)
 [Kinder gespielt] haben hier noch nie.
 children played have here yet never
 'Children have never played here.'

Instead of assuming that there are canonical positions for subjects and objects in S and VP respectively, and that only scrambled objects are adjoined, Berman does away with S completely, and always adjoins Mittelfeld arguments to VP. Furthermore, Berman posits that verbs in the verb cluster are combined by head adjunction. The structure of (23a) under this model is then (25).



Since the association of arguments with their predicates can no longer rely on positional grammatical function annotations, Berman (2003) argues that case is responsible for this association in German. This is modelled using the standard approach of conditional expressions that relate specific cases to specific functions, for instance, $(\downarrow \text{CASE})=\text{ACC} \Rightarrow (\uparrow \text{OBJ})=\downarrow$. However, Berman does not discuss how this standard approach should be extended to allow embedded objects of coherently combined verbs in general, and it is not clear how one would correctly constrain the projection of multiple Mittelfeld objects onto f-structures that are embedded under one or more layers of xCOMP without resorting to nested VPs or functional uncertainty.¹⁹

We have seen that the (idealized) Dutch and German patterns are mirror images in terms of the order of the verbs in the verb cluster. The approach of Zaenen & Kaplan (2002) capitalizes on this by taking the mirror image of the \bar{V} rule for Dutch in (20b) as the basis for their analysis of the German verb cluster (26).

$$(26) \quad \bar{V} \quad \rightarrow \quad \left(\begin{array}{c} \bar{V} \\ (\uparrow \text{xCOMP})=\downarrow \\ -((\uparrow \text{xCOMP}^+ \text{OBJ}) <_f (\uparrow \text{OBJ})) \end{array} \right) \quad \begin{array}{c} V \\ \uparrow=\downarrow \end{array}$$

As before, in the proposal for Dutch, the highest \bar{V} node corresponds directly to the right bracket and functional uncertainty solves the relation of Mittelfeld material to embedded verbs without having to assume nested VPs.

2.1.2.3 Variation I already mentioned at the beginning of this subsection that characterizing languages as having either cross-serial or nested dependencies is an oversimplification. For instance, both German and Dutch allow further variation in the ordering of elements in the verbal cluster. Moreover, in Zürich German – amongst other CWG languages – Mittelfeld and right bracket material can mix to some extent.

In German, *Oberfeldumstellung* (also known as *auxiliary flip*) can occur with three-verb combinations where V_1 is a perfect or passive auxiliary, and V_2 is itself a coherently combining verb that selects an infinitive. In this construction, the verb cluster has the order $V_1V_3V_2$, and IPP is triggered for V_2 . Contrast the “regularly ordered” (27a) with the *Oberfeldumstellung* in (27b).²⁰

¹⁹Berman (2003) partially sidesteps the issue by (tacitly) assuming that auxiliaries add features and do not create xCOMP embeddings. This means that, for instance, *lobte* ‘praised’ and *hat gelobt* ‘has praised’ both have their objects directly in the containing f-structure as OBJs. However, since not all coherently combining verbs can be analysed as auxiliaries and some clearly have enough lexical content to warrant their own PRED values, this does not completely address the problem.

²⁰*Oberfeldumstellung* also occurs with longer verb clusters. Furthermore, there is a (possibly regional) construction called *Zwischenstellung* that has $V_3V_1V_2$. See Cook (2001) for empirical discussion and an analysis.

- (27) German (Cook 2001: §1.4, example 1.31)
- a. ...dass ich dich kommen gesehen habe.
COMP I you.ACC.SG come.INF seen have.PRS
'...that I have seen you come.'
- b. ...dass ich dich habe kommen sehen.
COMP I you.ACC.SG have.PRS come.INF see.INF

This word order variant is problematic for the nested VP models mentioned above (namely, Netter 1988; Choi 1999), since the verb cluster-initial finite verb “interrupts” the embedded VP. Models in which a c-structure node corresponds to the verb cluster (namely, Zaenen & Kaplan 2002; Berman 2003; Clément et al. 2002) have an easier time capturing such variation. An analysis of this variation can be found in Clément et al. (2002: in terms of c-structure) and in Cook (2001: in terms of the interaction between syntax and information structure). An OT-LFG analysis of verb order in Swiss German dialects is outlined in Seiler (2007).

Dutch verb clusters have so-called *participle climbing* and *particle climbing*, which refer to the realization of participles and particles to the left of the position expected from the principle of ordering by increasing embedding. Example (28) shows the different positions a particle can occupy in a three-verb cluster.

- (28) Dutch
- ...dat Jan het liedje {mee} zal {mee} hebben {mee-}gezongen.
COMP Jan the song along will along have along-sung
'...that Jan will have sung along to the song.'

Kaplan & Zaenen (2003) adapt their earlier model of the Dutch Mittelfeld and verb-cluster to allow these and further variants, and to capture the IPP effect. Poortvliet (2015) is a further development of this model.

Zürich German has cross-serial dependencies, like Dutch, but in addition allows the nominal and verbal material to mix, as in (29).

- (29) Zürich German
- ...das er sini chind wil mediziin la schtudiere.
COMP he his children wants medicine let study
'that he wants to let his children study medicine.'

Zaenen & Kaplan (1995) use the combination of functional precedence and functional uncertainty developed for Dutch to capture these data. Another case of mixing verbal and non-verbal material can be found in Standard German, which allows a variant of Oberfeldumstellung where V_1 precedes a collocational nominal complement of V_3 . An analysis of this construction can be found in Cook (2001).

2.1.3 Nachfeld

The two options for adding Nachfeld material to the different c-structures of the clause given above are 1) adjunction to any of the nodes at the right periphery and 2) inclusion of one or more optional daughters on the right-hand side of the relevant c-structure rules. Adjunction is used by Berman (2003), who assumes Nachfeld occupants (typically PPs, VPs or CPs) are right-adjoined at the VP level. Rohrer (1996), Clément et al. (2002) and Van der Beek (2005) model the Nachfeld as an optional daughter in the node covering the whole clause. Zaenen & Kaplan (1995; 2002), and Kaplan & Zaenen (2003) insert the optional daughter in the node covering the Mittelfeld/right bracket.

In Dutch and German, the non-finite complement of an incoherently combining verb appears in the Nachfeld. In Dutch, Mittelfeld placement of such a complement is ruled out (30), but in German it is allowed (see for instance Rohrer 1996 for examples).

- (30) Dutch
 Vf- lb- Mf————— rb—— Nf—————
 Hij had {*geen auto te kopen} beloofd {geen auto te kopen}.
 he had no car buy.TEINF promised no car buy.TEINF
 ‘He had promised not to buy a car.’

To facilitate lexical specification of whether a verb combines coherently or not, and the formulation of placement restrictions on the non-finite verbal complement, Rohrer (1996), Zaenen & Kaplan (1995; 2002), and Kaplan & Zaenen (2003) associate coherence with selecting an xCOMP and incoherence with selecting a COMP. The relevant c-structure rule from Kaplan & Zaenen (2003) is an extension of (20a) and is given here in slightly simplified form as (31).

- (31) VP \rightarrow DP* \bar{V} $\left(\begin{array}{c} \text{VP} \\ (\uparrow \text{xCOMP}^* \text{COMP})=\downarrow \end{array} \right)$
 $(\uparrow \text{xCOMP}^* (\text{COMP}) \text{OBJ})=\downarrow$ $\uparrow=\downarrow$

The optional rightmost daughter contains a non-finite complement in the Nachfeld, assigned COMP.²¹

The rule in (31) also allows for the so-called *third construction*, a marked construction in Dutch and German in which a dependent of an incoherently combined non-finite complement in the Nachfeld is realized in the Mittelfeld of the

²¹The distinction between COMP and xCOMP is that of complements that supply their own subject (closed complements) and complements that do not supply their own subject (open complements). Since non-finite COMPS do not have an overt subject, they therefore must have an f-structure subject PRED ‘pro’, whose interpretation is equated to one of the arguments of the selecting verbs using anaphoric control. See Dalrymple (2001: Chapter 12, §3) for a discussion of anaphoric control.

containing clause. In terms of word order, this construction therefore mixes properties of coherent and incoherent combination. An example of the third construction is presented in (32). Note that the lack of an IPP effect on *geprobeerd* ‘tried’ shows that we are dealing with incoherent combination.

- (32) Dutch
 Hij had een auto geprobeerd te kopen.
 he had a car tried buy.TEINF
 ‘He had tried to buy a car.’

The c-structure rule in (31) captures the third construction by the functional uncertainty-based grammatical function assignment of DPs in the Mittelfeld: the optional COMP in the path allows it to reach into an incoherently combined complement.²² LFG analyses of the the German third construction are discussed in Rohrer (1996) and Kaplan & Zaenen (2003).

2.2 Topics related to the left periphery

2.2.1 Topicalization

In the context of the verb-second CWG languages, topicalization refers to Vorfeld placement of material, in particular material that is *not* put there by default. Roughly, then, topicalization is Vorfeld placement of anything but the local subject. The term topicalization is used irrespective of whether the Vorfeld occupant is a topic or not. In both German and Dutch, the Vorfeld may be occupied by a categorially and functionally wide range of constituents. It is also a target position for material extracted from embedded clauses and phrases.

Berman (2003: Chapter 6) formally distinguishes two different types of topicalization for German, depending on whether the Vorfeld constituent is local to the matrix clause or whether a long-distance dependency is involved. Berman introduces this distinction on the basis of observations from weak cross-over, which will be discussed in Section 2.4.2, below. In either case, the Vorfeld is Spec-CP, and its definition is part of the straightforward c-structure rule in (33).

- (33) CP \rightarrow XP \bar{C}
 (\uparrow DF)= \downarrow \uparrow = \downarrow

²²Kaplan & Zaenen (2003) are not concerned with CP complements – that is, finite complement clauses – but if these are assigned COMP as well, the analysis of the third construction sketched here will need to be further constrained to prevent lifting dependents from finite subordinate clauses into the Mittelfeld.

When material local to the f-structure projected from CP is put in the Vorfeld, Berman assumes information like case and agreement drives the association with grammatical function, just as it does in the Mittelfeld – see the earlier discussion of Berman’s model in Section 2.1.2, around example (25). For long-distance dependencies, Berman posits the presence of a trace at the extraction site, annotated with an inside-out functional uncertainty equation to incorporate the f-structure of the Vorfeld constituents – which by (33) is the DF of the f-structure of the whole clause – into the extraction site’s f-structure.²³

German has embedded verb-second clauses with bridge verbs, provided the complementizer is absent, as in (34a). Extraction out of such embedded clauses is also allowed, on the condition that none of the clauses involved in the long-distance dependency has material in Spec-CP (that is, no intermediate clause has a Vorfeld occupant). This is shown in the contrast (34b,c).

- (34) German (b,c from Berman 2003: §6.2.4, examples 23, 24)
- a. Ich glaube, (*dass) der Hans sagte gestern, (*dass) die
 I believe COMP the.NOM Hans said yesterday, COMP the.NOM
 Maria hat den Peter eingeladen.
 Maria has the.ACC Peter invited
 ‘I think Hans said yesterday that Maria invited Peter.’
 - b. Den Peter glaube ich, sagte der Hans gestern, hat
 the.ACC Peter think I said the.NOM Hans yesterday has
 die Maria eingeladen.
 the.NOM Maria invited
 - c. *Den Peter glaube ich, gestern sagte der Hans, hat
 the.ACC Peter think I yesterday said the.NOM Hans has
 die Maria eingeladen.
 the.NOM Maria invited

Berman captures this restriction with an off-path constraint $\neg(\rightarrow \text{DF})$ on the functional uncertainty equation for extractions. Since only Spec-CP introduces DF in Berman’s model,²⁴ this effectively rules out examples like (34c).²⁵

²³See Kaplan & Zaenen forthcoming [this volume] for more information on modelling long-distance dependencies using inside-out functional uncertainty.

²⁴For this to hold, we need to understand DF as not including SUBJ, since subjects can be introduced in other positions in the clause, too. Indeed, as the example shows, there is no ban on subjects occurring anywhere in the path of a long-distance dependency, as long as they do not occur in the Vorfeld. An unfortunate side effect of taking DF as not including SUBJ would be that the special Vorfeld privileges of subjects, see Section 2.2.2, remain unmodelled.

²⁵However, consider the following data:

In non-LFG work, Reis (1996) argues that sentences like (34b) are only apparent cases of extraction, and that they involve parenthetical constructions, instead. An LFG analysis of German parentheticals with bridge verbs is given in Fortmann (2006), although he does not consider the exact type of sentence discussed here.

German allows topicalization of VPs (as discussed above in Section 2.1.2.2, example 23) and, in the case of coherent combination, topicalization of partial VPs. For instance, in (35), the main verb and its accusative object are realized in the Vorfeld, whereas the dative object is in the Mittelfeld.

- (35) Ein Märchen erzählen wird er ihr.
 a fairy tale tell.INF will he her.DAT
 ‘He will tell her a story.’

VP topicalization can in principle be modelled using the standard mechanisms. For instance, under the assumption that coherently combined verbal complements are XCOMPS and if we use outside-in functional uncertainty, a c-structure rule like in (36) implements topicalization of coherently combined VPs.

- (36) CP \rightarrow VP \bar{C}
 (\uparrow TOPIC)= \downarrow \uparrow = \downarrow
 (\uparrow XCOMP⁺)= \downarrow

If the rule for VPs allows partial VPs, rule (36) says very little about which material is required to be present in the fronted VP and which material can be left to be realized in-situ. Potentially, then, this also captures partial VP topicalization. Zaenen & Kaplan (2002) problematize two aspects of such a straightforward implementation: First, in the case of partial VP topicalization, the resulting f-structure for the whole VP contains the combined topicalized and in-situ material, and

-
- (i) a. Ich denke hier, Sie sollten etwas präziser sein.
 I think here you should somewhat precise.COMPARATIVE be
 ‘I think here(:) you should be a bit more precise.’
 b. Hier denke ich, Sie sollten etwas präziser sein.
 (ii) a. Ich denke, Sie sollten hier etwas präziser sein.
 I think(:) you should be a bit more precise here.’
 b. Hier denke ich, sollten Sie etwas präziser sein.

Although the off-path constraint against DFS gets rid of the form (i b) as a realization of the meaning of (ii), it does not block (ii b) as a realization of the meaning of (i). In other words, the off-path constraint itself leaves unexplained why the embedded V1 of (ii b) signals that it is involved in an extraction. A possible line of defence against this criticism is to appeal to a form of Economy of Expression: the embedded V1 is a slightly more complex structure than embedded V2, a complexity that is not needed for the relational information expressed in (i).

therefore there is no way to see at f-structure which part of the VP was topicalized. This is problematic for approaches to information structure that associate information status with f-structures. Secondly, the approach would erroneously allow examples like (37).

- (37) * [Ihr ein Märchen] wird er erzählen.
 her.DAT a fairy tale will he tell.INF
 ‘He will tell her a fairy tale.’

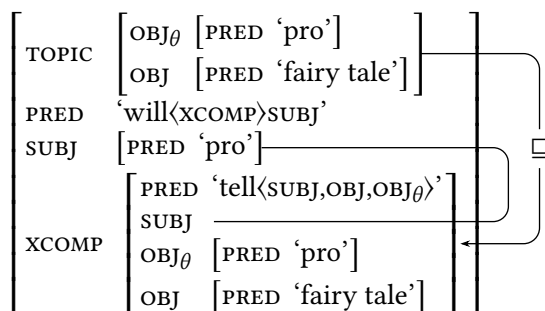
The preverbal material is here analysed as a headless VP, which is generally only allowed postverbally.²⁶

Zaenen & Kaplan (2002) solve these problems by replacing unification with *subsumption* in the functional uncertainty annotation of Spec-CP, along the lines of (38).

- (38) CP \rightarrow VP \bar{C}
 (\uparrow TOPIC)= \downarrow \uparrow = \downarrow
 $\downarrow \sqsubseteq (\uparrow$ XCOMP $^+)$

This directly solves the first problem, since the information in TOPIC now no longer contains the f-structure for the whole VP, but only information projected from the material in the Vorfeld. It also solves the second problem, since, as shown in (39), the f-structure for the example in (37) under TOPIC now no longer meets LFG’s *coherence* condition – it contains arguments but no predicate to select them.

- (39) F-structure for (37), which violates the coherence condition:



²⁶I am aware that this claim is too broad. See for instance Müller et al. (2012), who use headless Vorfeld VPs in their analysis of apparent multiple fronting in German. However, a discussion of exceptions to this rule would take us too far away from the main topic here.

Finally, a reformulation of the *completeness* condition to take subsumption relations into account²⁷ allows the f-structures resulting from topicalizing a partial VP, as illustrated in (40).

- (40) a. Ein Märchen erzählen wird er ihr.
 a fairy tale tell.INF will he her.DAT
 ‘He will tell her a story.’
- b.
- | | | | | | | |
|-------|------------------|---|--|--|-------------------|--|
| TOPIC | [| PRED ‘tell⟨SUBJ,OBJ,OBJ _θ ⟩’ | | | | |
| | OBJ | [| | | PRED ‘fairy tale’ | |
| PRED | | ‘will⟨XCOMP⟩SUBJ’ | | | | |
| SUBJ | [| PRED ‘pro’ | | | | |
| XCOMP | [| PRED ‘tell⟨SUBJ,OBJ,OBJ _θ ⟩’ | | | | |
| | SUBJ | _____ | | | | |
| | OBJ _θ | [| | | PRED ‘pro’ | |
| | OBJ | [| | | PRED ‘fairy tale’ | |
-

Berman (2003: §3.3) solves the ungrammaticality of examples structurally similar to (37) by appealing to the endocentricity principles as formulated for LFG, which include the constraint that every lexical category must have an extended head (Bresnan et al. 2016: §7.2). In (37), neither the main verb *erzählen* nor the auxiliary *wird* c-command the material in the Vorfeld VP, which leaves the fronted VP without an extended head. Note that this solution would not be compatible with Zaenen & Kaplan’s conception of the German clause, as they do not assume the German VP is necessarily endocentric.²⁸

2.2.2 The Vorfeld subject-object asymmetry

In both German and Dutch, the main clause subject is privileged when it comes to realization in the Vorfeld. In LFG work, this can be modelled directly by annotating the Vorfeld position at c-structure explicitly with $(\uparrow \text{SUBJ})=\downarrow$ (Theiler & Bouma 2012), or by annotating it with $(\uparrow \text{DF})=\downarrow$, under the assumption that the grammaticalized discourse functions include the subject (Berman 2003: §3.2.1).²⁹

²⁷“An f-structure *g* is complete if and only if each of its subsidiary f-structures is either locally complete or subsumes a subsidiary f-structure of *g* that is locally complete” (Zaenen & Kaplan 2002: [24]).

²⁸As mentioned in Section 2.1, above, Zaenen & Kaplan use the label S|VP for this category.

²⁹I refer, however, to the comment in footnote 24, where I point out that the analysis of German embedded verb-second clauses discussed there relies on the contradicting assumption that SUBJ is *not* part of DF.

In an OT-LFG setting, Choi (2001) posits a high-ranking constraint SUBJECT-LEFT that prefers early realization of the subject, which includes realization in the Vorfeld.

One of the reflexes of this special relation between the Vorfeld and the main clause subject is a contrast like the following:

- (41) German (Meinunger 2007)
 Wo ist das Geld?
 ‘Where is the money?’
- a. Es liegt auf dem Tisch.
 it lies on the table
 ‘It is on the table.’
 - b. * Es hat Bernd auf den Tisch gelegt.
 it has Bernd on the table put
 ‘Bernd (has) put it on the table.’

Although the referent of the weak pronoun *es* has the same information status in both cases, it appears it can only occur in the Vorfeld as a subject, and not as an object. This would fit in with any of the approaches sketched above: being a subject alone is enough reason to be allowed in the Vorfeld, but – apparently – the weak pronoun *es* is incompatible with any of the other information structural functions of Vorfeld constituents.

The ban on object *es* in the Vorfeld is not categorical, however. Meinunger (2007, and references therein) gives many examples, and shows that the conditions under which object *es* can appear in the Vorfeld coincide with the conditions for the use of the homonymic Vorfeld expletive used in the presentational construction. In particular, the subject of the clause should not be topic (42).

- (42) a. Es hat {jemand / *er} geklaut
 it has someone he stolen
 ‘Someone / *he has stolen it’
- b. Es hat {jemand / *er} das Geld geklaut
 EXPL has someone he the money stolen
 ‘Someone / *he has stolen the money.’

Theiler & Bouma (2012) capture this behaviour by assuming that the common source of sentences with a Vorfeld object and of those with Vorfeld expletive *es* is the latter, the presentational construction. The presence of *es* in the Vorfeld signals exactly that the main clause subject is not topic. This construction is

modelled using a c-structure rule that explicitly mentions the form of its first daughter.

$$(43) \quad CP \longrightarrow \begin{array}{c} NP \\ (\downarrow \text{FORM}) =_c \text{ES} \\ ((\uparrow \text{SUBJ})_\sigma \text{DF}) \neq \text{TOPIC} \\ ((\uparrow \text{XCOMP}^* \text{OBJ}) = \downarrow) \end{array} \quad \bar{C} \quad \uparrow = \downarrow$$

The optional assignment to object anywhere in the coherence domain of the clause is what allows object *es* to appear in the Vorfeld, under the same circumstances as the presentational construction's expletive. Expletive *es* also shows up in other situations; see Section 2.5.1 below.

2.2.3 Left dislocation

Thus far, we have not considered the *lead* field, which is positioned before the Vorfeld in the topological model given in (1) and which we characterized as reserved for material more loosely connected to the clause proper. We can distinguish several *left dislocation* phenomena that target the lead.³⁰ Two questions raised by this broadened view of the clause are 1) how tightly left-dislocated material is coupled to the clause, and 2) whether there are phenomena that we have treated as Vorfeld occupation that are better analysed as left dislocation with an empty Vorfeld?

The first question is central in Zaenen (1996), who studies contrastive left dislocation (44b) in Dutch and Icelandic, and asks whether this should be treated as topicalization (44a) or as a hanging topic (44c). The former counts as a well-integrated part of the clause, the latter has a looser relation to the clause.

- (44) Dutch
- a. Jan wil ik hier nooit meer zien.
Jan want I here never again see
 - b. Jan die wil ik hier nooit meer zien.
Jan DEM want I here never again see
 - c. Jan, ik wil hem hier nooit meer zien.
Jan I want him here never again see
'Jan, I never want to see (him) here again'

³⁰We can likewise talk of right-dislocated material, positioned in the tail, but since we are not aware of any LFG discussions of right dislocation, we will ignore this phenomenon in this chapter.

On the basis of categorial constraints on different kinds of left-dislocated material and on the basis of binding data, Zaenen concludes that contrastive left-dislocation patterns with topicalization in both languages. She proposes an analysis in which the contrastively left-dislocated material is connected to the clause using the same functional uncertainty equations we normally assume for topicalized material in the Vorfeld. The pronominal element in the Vorfeld in a contrastive left-dislocation is taken to be an (f-structure) adjunct to the left-dislocated material, and does not itself engage in the long-distance dependencies directly.

The second question underlies the discussion in Berman (2003: §7.4), which revolves around the contrast illustrated in (45).

- (45) German (Berman 2003: §7.4, examples 58–61)
- a. Dass die Erde rund ist, (das) hat ihn gewundert.
COMP the earth round is DEM.NOM has him.ACC surprised
 ‘That the earth is round(, that) surprised him.’
 - b. Dass die Erde rund ist, (das) hat er nicht gewusst.
DEM.ACC has he not known
 ‘That the earth is round, (that) he didn’t know.’
 - c. Dass die Erde rund ist, *(dessen) war sie sich nicht bewusst.
DEM.GEN was she REFL not aware
 ‘That the earth is round, of that she wasn’t aware.’
 - d. Dass die Erde rund ist, *(darüber) hat sie sich gewundert.
about.DEM has she REFL surprised
 ‘That the earth is round, that she was surprised about.’

In (45a,b), the fronted CP appears to alternate between being left-dislocated (with resumption) and appearing in the Vorfeld (without), whereas in (45c,d), the fronted CP must be left-dislocated. Berman gives an LFG interpretation of an existing approach in which this alternation is only apparent, and the CP is *always* left-dislocated. The difference in (45a,b) is that in German, nominative and accusative topics may be dropped from the Vorfeld. Whether the resumptive demonstrative pronoun is realized at c-structure or not, its f-structure presence is constant, and it is this which is assigned a grammatical function. The left-dislocated CP is connected anaphorically to the resumptive pronoun.

2.2.4 Split NPs

The split NP construction in German involves multiple NPs at different positions in the clause which together describe one argument. The first NP occurs in the

Vorfeld of the top level clause, and a further NP occurs somewhere further down in the Mittelfeld of a possibly embedded clause. An example is (46a).

- (46) German (Kuhn 2001: §1)
- a. [Ein Schwimmbad] hat er sich noch [keins] gebaut.
a swimming pool has he REFL yet none built.
 - b. Er hat sich noch [kein Schwimmbad] gebaut.
he has REFL yet no swimming pool built
'He hasn't built a swimming pool yet.'

A striking property of the two NPs *ein Schwimmbad* and *keins* is that they both have the form of complete NPs: the first NP includes a determiner for the head count noun, the second NP involves the independent form *keins* 'none', rather than the form *kein* 'no', which is used when a nominal head is realized in the NP itself (46b).

Kuhn (2001) proposes a solution in terms of an LFG variant with linear logic-based semantics. Semantically, the clause-internal NP is a regular elliptical NP; the job of the Vorfeld NP is to supply a property as antecedent. By assuming that the form of the NP can be syntactically determined completely in terms of c-structure, treating the two NPs as c-structurally independent, but projecting to the same f-structure, the form-related characteristics of the NPs can be made to follow.

2.2.5 Asymmetric coordination

Frank (2006) gives an analysis of asymmetric coordination puzzles in German, like the *subject gap with fronted finite verb* (SGF) coordination in (47a).

- (47) German (Frank 2006: §3.2)
- a. In den Wald [ging der Jäger] und [fing einen Hasen]
in the.ACC forest went the.NOM hunter and caught a.ACC hare
'The hunter went into the woods and caught a hare.'
 - b. * In den Wald ging der Jäger und einen Hasen fing.
in the.ACC forest went the.NOM hunter and a.ACC hare caught

At first sight, this looks like a run-of-the-mill symmetric \bar{C} coordination. However, this is not the case, since the PP in the Vorfeld is unambiguously a directional PP, which is incompatible with the verb in the second conjunct. Furthermore, what is shared between the two conjuncts is the subject in the Mittelfeld

of the first conjunct, which is not in a c-structural position that would lead us to expect this possibility.

Frank models SGF coordination using an optional annotation on the rule for symmetric CP coordinations, which shares the (grammaticalized) discourse function of the first conjunct with the coordination as a whole, and therefore, with the second conjunct.³¹

$$(48) \quad \text{CP} \longrightarrow \begin{array}{ccc} \text{CP} & \text{Coord} & \text{CP} \\ \uparrow \in \downarrow & \uparrow = \downarrow & \uparrow \in \downarrow \\ ((\uparrow \text{GDF}) = (\downarrow \text{GDF})) & & \end{array}$$

This extra annotation makes sure the completeness requirements in the second conjunct can be met. Frank also shows that this approach makes correct predictions with respect to the interpretation of the scope of quantified subjects in an SGF coordination. However, the formal account leaves unexplained why the second conjunct cannot have a fronted object, like the ungrammatical (47b). For this, Frank appeals to the discourse structure of SGF coordination: the second conjunct is conceptualized as part of the discourse-functional domain of the first. If the second conjunct were to have a Vorfeld TOPIC or FOCUS, this would indicate that it sets up its own discourse-functional domain.

2.3 Topics related to the right periphery

2.3.1 Clefts

The it-cleft construction in Dutch involves a neuter weak pronoun (typically *het* ‘it’), a copula, focused material, and a backgrounded finite clause in the Nachfeld. Van der Beek (2005: Chapter 2) shows that, with these ingredients, there are in fact two distinct cleft constructions: the intransitive cleft (an existential copula with extraposed complement clause, 49a) and the transitive cleft (an identificational copula with extraposed relative clause, 49b).

(49) Dutch (Van der Beek 2005: Figures 2.4 and 2.1)

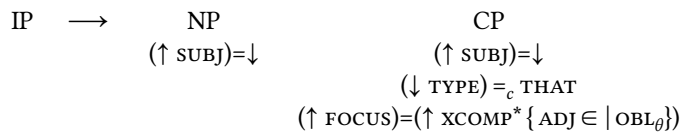
- a. Het is aan hem dat ze denkt.
EXPL is on him COMPL she thinks.
‘It is of him that she is thinking.’
- b. Het zijn jouw kinderen die huilen.
it are your children REL cry
‘It is your children who are crying.’

³¹Here, too, the grammaticalized discourse functions include the subject. In fact, in this construction, the shared material will always turn out to be the subject.

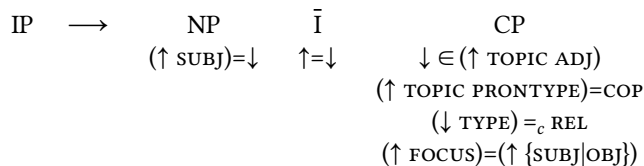
Van der Beek shows that the two cleft types differ further in whether they involve an expletive or referential neuter pronoun, whether they tolerate pseudo-copulas like *bleken* ‘seem’, or only forms of the verb *zijn* ‘be’, and whether the neuter pronoun is obligatorily the cleft subject or not.

Van der Beek models both cleft types with dedicated c-structure rules to capture the fixed position of the backgrounded clause, and to introduce the construction-specific annotations. This ensures, for instance, that the clause must be in the Nachfeld, and cannot be realized as one constituent with the pronoun or the focused material. In the intransitive cleft, both the expletive and the complement clause project to the SUBJ’s f-structure, and the focused material is linked to an adjunct or oblique position in f-structure (*aan hem* ‘on him’ in 49a). In the transitive cleft, the relative clause is an adjunct of the referential weak neuter pronoun, which is the construction’s TOPIC, and which is subject or object depending on properties of the focused material. The top level c-structure rules for the two constructions are given in (50).

(50) a. intransitive cleft:



b. transitive cleft:



The TYPE feature of the CP-projected f-structures distinguishes relative clauses from complement clauses headed by *dat* ‘that’. The PRONTYPE=COP restriction singles out a class of special copular pronouns which are N.3SG in form, but which show a wider range of agreement, whose existence can be argued for on independent grounds.

2.3.2 Correlative *es* and extraposed CPs

The constructions discussed in Berman et al. (1998) and Berman (2003: Chapter 8) also contain a neuter pronoun and a finite clause in the Nachfeld. In this case, the pronoun and the finite clause realize a propositional argument of the clause’s main verb, and they can either appear on their own (51a,b) or together (51c), in which case the pronoun is referred to as a *correlative pronoun*.

- (51) German (Berman et al. 1998: §1, examples 1 and 2)
- a. Hans hat bedauert, daß er gelogen hat.
 Hans has regretted that he lied has
 Hans regretted that he lied.
 - b. Hans hat es bedauert.
 Hans has it regretted
 Hans regretted it.
 - c. Hans hat es bedauert, daß er gelogen hat.
 Hans has it regretted that he lied has

The central modelling assumptions made in both analyses are that the pronoun is referential – whether it occurs on its own or as a correlative together with the finite clause – and that the pronoun and the finite clause when they appear alone (51a,b), are OBJs. In the correlative pronoun construction (51c), however, it is the pronoun that has this grammatical function. The finite clause is then either seen as supplying further semantic restrictions to the interpretation of this pronoun (Berman et al. 1998: see also Section 2.2.4 above) or as an apposition to the pronoun (Berman 2003).

Berman (2003) also goes on to show that there is a range of correlative *es* data, and that despite superficial resemblances, different syntactic analyses are called for. For instance, Berman argues that in contrast to the data above, the psych verb *stören* ‘disturb’ in (52) has a different argument structure for the cases with correlative *es*: it either takes the finite clause as subject when the correlative is absent, or it takes *es* as subject and the finite clause as object when the correlative is present.

- (52) German (Berman 2003: §8.1, example 2d)
- ...weil (es) mich stört, dass sie den Hans liebt.
 because EXPL me bothers COMP she the.ACC Hans loves.
 ‘...because it bothers me that she loves Hans.’

2.4 Topics related to the ordering of dependents

2.4.1 Scrambling

Material in the Mittelfeld can be reordered to a certain extent. For instance, Dutch allows different orders of object and adverb (53).

(53) Dutch

Anna heeft {de was} gisteren {de was} gedaan.
Anna has the laundry yesterday the laundry done
'Anna did the laundry yesterday.'

In German, the order of arguments themselves is free, as well. Example (54) shows one order for the arguments of a ditransitive, but the other five possible argument orders are grammatical, too.

(54) German (Haider & Rosengren 2003: §1, example 1)

...dass [das Objekt] [dem Subjekt] [den ersten Platz]
COMP the.NOM object the.DAT subject the.ACC first place
streitig macht.
competes.for
'...that the object competes for first position with the subject.'

In general, both scrambling over adjuncts and scrambling of arguments is sensitive to information structural effects, and – related to this – things like the referential form of the material involved. Choi (1999; 2001) explains German scrambling and clause-local fronting facts using an OT-LFG model in which constraints on canonical ordering of grammatical functions conflict with constraints on information structurally induced ordering. An information structural account of clause-local word order variation and quantifier scope in German is given in Cook & Payne (2006). The explanation given by Cook (2006) for a deviating unmarked word order in a small group of ditransitives is discussed below, in Section 2.5.2.

As far as the order of arguments in the *Mittelfeld* is concerned, Dutch is much more restricted than German. Nevertheless there is some variation. An OT account of the Dutch dative alternation, which also covers variation in the ordering of direct object and indirect object, is presented in Van der Beek (2005). Zaenen (1989) discusses scrambling of objects over subjects with Dutch experiencer verbs and passives of ditransitives, and argues for an effect of thematic role.

The cross-serial dependency pattern comes about when objects and verbs are in separate groups and both are ordered in the same fashion according to level of embedding. The verb cluster rule given in (20) above (Zaenen & Kaplan 1995), sorts embedding verbs before embedded ones, and explicitly forces the same order on the objects with the help of an *f*-precedence constraint. In her work on the order of objects in Dutch, Van der Beek (2005: §3.8) argues that this constraint should be treated as a violable OT constraint. An optionally higher ranking constraint prefers early realization in the *Mittelfeld* of a third person, inanimate pro-

noun. This constraint explains examples like (55), in which the object pronoun belonging to the embedded verb precedes the object belonging to the finite verb.

- (55) Ik zag_{OBJ:1} 't₂ Jo₁ doen_{OBJ:2}.
 I saw it Jo do
 'I saw Jo do it.'

As with all scrambling, this type of scrambling is less constrained in German, and may also apply to full NPs, and even involve scrambling of an embedded object over the main clause subject. I am however not aware of any LFG-related work on this.³²

2.4.2 Weak cross-over

In German, scrambling and topicalization interact with binding between arguments, which results in data like (56). Note that the grammaticality judgements are relative to the co-indexations given in the examples.

- (56) German (Berman 2003, §5.2, examples 10a, 11b, 10d, 11d, 27, 31; examples a–d below originally from Choi 1995)
- a. ...dass jeden_i seine_i Mutter mag.
 COMP everyone.ACC his mother likes
 '...that their_i mother likes everyone_i.'³³
 - b. Jeden_i mag seine_i Mutter.
 everyone.ACC likes his mother
 'Their_i mother likes everyone_i.'
 - c. * ...dass seine_i Mutter jeden_i mag.
 COMP his mother everyone.ACC likes
 - d. * Seine_i Mutter mag jeden_i.
 his mother likes everyone.ACC
 - e. Jeden_i sagte sie, habe seine_i Mutter getröstet.
 everyone.ACC said she has.SBJV his mother consoled
 'Everyone_i, she said their_i mother had consoled.'

³²The term *embedded object shift* is van der Beek's term for this type of word order variation. In the literature on German, the phenomenon is sometimes discussed as a kind of *long(-distance) scrambling*, that is, scrambling across clause boundaries, although the view that the embedded object leaves its clause goes against the conception of coherent combining as clause union. In fact, in Lee-Schoenfeld (2007), this type of scrambling is taken as one of the hallmarks of coherence and thus of monoclausality.

³³English seems to require the passive to achieve the intended bindings. The intended reading in (56a–d) is therefore more naturally given as (*that*) *everyone is liked by their own mother*.

- f. *Jeden_i sagte seine_i Mutter, habe sie getröstet.
 everyone.ACC said his mother has.SBJV she consoled
 ‘Everyone_i, their_i mother said she had consoled.’

Between dependents of the same predicate, an object may bind into the subject, provided it precedes it. It does not matter whether it precedes it in the Mittelfeld (56a) or by being moved into the Vorfeld (56b), even from an embedded clause (56e). However, as (56f) shows, an object cannot bind into an upstairs subject, even when it precedes it.

Berman (2003), using the framework of Bresnan (1998) and observations from Choi (1995), shows that the data in (56a–d) is straightforwardly explained by assuming that to bind a pronoun, an operator must either outrank it in terms of grammatical function – this isn’t the case in any of these examples – or linearly precede it. The linear precedence constraint is satisfied in (56a,b), but not in (56c,d). However, example (56f) is problematic under this simple account, since the operator precedes the pronoun, but cannot bind it.

Berman therefore proposes to analyse long-distance dependencies using a trace, and to interpret the linear precedence requirement as if it includes this trace. The sentences in (56e,f) are then as in (57).³⁴

- (57) a. Jeden_i sagte sie, habe ε_i seine_i Mutter getröstet.
 everyone.ACC said she has.SBJV his.NOM mother consoled
 b. *Jeden_i sagte seine_i Mutter, habe ε_i sie getröstet.
 everyone.ACC said his.NOM mother has.SBJV she consoled

In (57a), the operator’s trace precedes the bound pronoun, so that the linear order requirement is met. In (57b), however, the trace follows the pronoun, which – under Berman’s definition – means the operator as a whole does not precede it. This results in the unavailability of the indexed reading.

Bresnan et al. (2016: §9.5) discuss the same data using a near-identical framework. Although the difference in linear order of the bound pronoun and the operator trace between (57a) and (57b) is noted, the ungrammaticality of (57b) is ultimately explained by taking the binding domain of the operator to be the f-structure for the predicate *getröstet* ‘consoled’, irrespective of the operator’s DF role in the matrix f-structure.³⁵ There is therefore no need to refer to the position

³⁴Berman (2003) assumes that local arguments are adjoined to VP, in any order. This also applies to traces – the object trace may therefore appear before its clause-mate subject. In the examples in (57) we have inserted the trace as early as c-structurally possible.

³⁵In contrast, Berman (2003: §5.2.6) explicitly considers the binding domain of the operator to be “extended to the matrix clause” because “it functions as a discourse function in the matrix clause” (p. 86).

of the trace to explain the long-distance dependency data. Under that analysis, it would appear that weak cross-over in German alone is not a reason to assume long-distance dependencies involve traces.

Dalrymple et al. (2001)³⁶ give a trace-less account of the German cross-over data. Rather than considering the linear order of the binding operator and the bound pronoun, they consider f-precedence between two f-structures that are dependents of the same predicate, such that one contains the operator and the other the pronoun. In (56f), these f-structure siblings are the *SUBJ* (containing the pronoun) and the *COMP* (containing the operator) of *sagte*. Since the latter does not f-precede the former, the linear precedence requirement on binding is not met.

2.5 Topics related to mapping

2.5.1 Sentences “without a subject” in German

A recurring debate in German clausal syntax concerns the existence of true subjectless sentences. Berman (2003: Chapter 4) points out that it would appear that German has such sentences, given that 1) under her analysis, German does not have a dedicated subject position, 2) there are no oblique subjects in German (a common view, following for instance Zaenen et al. 1985, but contra the later Eythórsson & Barðdal 2005) and 3) there are sentences without nominatives, such as (58).

(58) German (Berman 2003: §4.2, examples 10a, 16b, 10d; indication of optionality of expletive *mine*)

- a. ...weil (*es) getanzt wurde.
because EXPL danced was
'...because people were dancing.'
- b. ...weil (*es) dem Mädchen geholfen wurde.
because EXPL the.DAT girl helped was
'...because the girl was being helped.'
- c. ...weil (es) mich friert.
because EXPL me.ACC freezes
'...because I'm cold.'

³⁶This paper is a response to the trace-based proposals of Bresnan (1998) and Berman (2003). The latter was also published/circulated on earlier occasions, which explains the apparent anachronism.

Note that each of these *can* occur without the expletive pronoun *es*, and the first two *must* occur without it.

Berman models clauses without a subject using argument structures without a SUBJ, and shows that these cases can be given an analysis in terms of Lexical Mapping Theory (LMT).³⁷ For the predicates involved in the examples above, we have the following LMT derivations:

- (59) a. getanzt $\langle agent \rangle$ (lit. ‘danced’, impersonal passive)
 [-o]
 \emptyset
- b. geholfen $\langle agent, beneficiary \rangle$ (‘helped’, passive, lexical case)
 [-o] [+o]/DAT
 \emptyset OBJ θ
- c. frieren $\langle experiencer \rangle$ (‘be cold’, active intransitive, lexical case)
 [+o]/ACC
 OBJ θ

The question remains, then, why the expletive is not allowed in (58a,b), whereas it is in (58c). Berman adopts the analysis that German verbal agreement morphology is distinct enough to contribute subject features. Thus, the f-structures for the sentences in (58) all contain subjects. This way, German can be analysed as meeting the *Subject Condition*, which says that every f-structure with a predicate must contain a SUBJ.³⁸ Inserting a subject expletive would then be ruled out as a violation of Economy of Expression. It follows that the optional *es* in cases like (58c) is selected for: verbs like *frieren* have an alternative specification like the one in (60).

- (60) *frieren* (↑ PRED) = ‘be-cold<OBJ θ >SUBJ’
 (↑ SUBJ FORM) =_c ES_

2.5.2 Mapping explanations of variation

Zaenen (1993) is concerned with (the nature of) the unaccusative/unergative distinction in Dutch. One of the challenges in the characterization of unaccusativity in Dutch is that it not only applies to intransitives, but also to a subset of transitive experiencer verbs. Consider the examples in (61), which shows two intransitives, two transitives with the experiencer as the object, and a transitive with the

³⁷See Findlay & Kibort forthcoming [this volume] for more information on Lexical Mapping Theory.

³⁸This Subject Condition formulation pertains to f-structure. In other contexts, for instance in Bresnan et al. (2016: §14.4), the Subject Condition is taken to be a constraint on argument structures. It is clear that under Berman’s view such a constraint does not hold for German.

experiencer as the subject. The selection of a form of *zijn* ‘be’ instead of *hebben* ‘have’ as the perfect auxiliary is given here as the reflex of unaccusativity.

(61) Dutch

- a. Zij *is / heeft gewerkt.
she is has worked
- b. Zij is / *heeft gestorven.
she is has died
- c. Zij *zijn / hebben haar geirriteerd.
they are have her irritated
- d. Zij zijn / *hebben haar bevallen.
they are have her pleased
- e. Zij *is / heeft hen gevreesd.
She is has them feared.

Zaenen shows that it is possible to give semantic correlates of unaccusativity, and discusses which phenomena can be related directly to unaccusativity in Dutch (namely, auxiliary selection, prenominal attributive use of perfect participle) and which only relate indirectly (impossibility of impersonal passive). Her analysis is formalized in terms of a variant of LMT that does not rely on thematic roles to determine the intrinsic classifications of a predicate’s arguments. Instead, Zaenen incorporates Dowty’s (1991) proto-roles into LMT using the following simple rule: a participant that has more proto-agent than proto-patient properties is marked $[-o]$, otherwise the participant is marked $[-r]$. The LMT alternative is further spelled out to allow derivation of grammatical function assignments for the data in (61): the subjects in examples (61a,c,e), with *hebben* ‘have’, come from intrinsic $[-o]$ markings, whereas the subjects in (61b,d), with *zijn* ‘be’, come from intrinsic $[-r]$. The choice of auxiliary can be correctly modelled by referring to the intrinsic markings of the subject. Kordoni (2003) discusses analysing the German locative alternation in terms of Zaenen’s mapping account.³⁹

Another variation which is shown to be driven by lexical semantic differences that affect mapping are the so-called “high” versus “low” datives in German. Although arguments in the German Mittelfeld are readily scrambled, there is an unmarked order, which can be detected by studying information structural and quantifier scoping properties. Between objects, the unmarked order is generally DAT before ACC (62; “high dative”). However, a smaller number of verbs show ACC before DAT (63; “low dative”), and for a couple of verbs both orders appear to be unmarked. In the examples, superscript M marks the marked variant.

³⁹It should be noted that Dowty (1991) talks about the *English* locative alternation in terms of proto-roles in depth.

- (62) German (Cook 2006: §1, examples 1–2)
- a. Es hat ein Mann [einem Kind] [ein Buch] geschenkt.
EXPL has a.NOM man a.DAT child a.ACC book given
‘A man gave a book to a child (as a present).’
 - b. ^M Es hat ein Mann [ein Buch] [einem Kind] geschenkt.
- (63) a. ^M Es hat ein Polizist [einer Gefahr] [einen Zeugen]
EXPL has a.NOM policeman a.DAT danger a.ACC witness
ausgesetzt.
exposed
‘A policeman has exposed a witness to a danger.’
- b. Es hat ein Polizist [einen Zeugen] [einer Gefahr] ausgesetzt.

Cook (2006) demonstrates that the different unmarked orders can be related to differences in lexical semantics, which in turn give rise to thematic alternations. For the alternating verbs, it is shown that the different word orders prefer different readings in line with the general lexical semantic observations. All meanings/word orders involve an agent and a patient/theme, which under standard LMT assumptions are mapped to SUBJ and (accusative) OBJ, respectively. In addition, the DAT-ACC order is associated with a bene-/maleficiary role, which is mapped to a (dative) OBJ_θ. The ACC-DAT order, however, involves a third participant which is a goal or a location and which gets mapped to a (dative) OBL_θ. Cook argues that the unmarked order of complements in the German Mittelfeld is OBJ_θ-OBJ-OBL_θ. The apparent word order variation is thus a fixed word order seen in the light of the unmarked order of grammatical functions. Cook extends her account to explain the compatibility of the different datives with the *kriegen*-passive, which can be used with a selection of verbs to promote the dative argument to subject.

2.5.3 Transitivity of reflexives

Lexically conditioned reflexives in German and Dutch show up in a range of situations. The simplex reflexives *sich* in German and *zich* in Dutch appear for instance in clauses with transitive verbs with co-referring arguments (64a)/(65a),⁴⁰ in anticausatives (64b)/(65b), and in inherent reflexives (64c)/(65c).

⁴⁰The class of grooming verbs is part of a larger class of transitive verbs that, exceptionally, allows the simplex reflexive. In general, the complex reflexive, *zichzelf* / *sich selbst* is available to realize reflexive objects with transitive verbs. This exception is what justifies treating these reflexives as being lexically specified.

- (64) a. Max rasiert sich.
 Max shaves REFL
 ‘Max shaves himself.’
 b. Die Tür öffnet sich.
 the door opens REFL
 ‘The door opens.’
 c. Max schämt sich.
 Max is.ashamed REFL
 ‘Max is ashamed.’
- (65) a. Max scheert zich.
 Max shaves REFL
 b. De deur opent zich.
 the door opens REFL
 c. Max schaamt zich.
 Max is.ashamed REFL

In a contrastive study of reflexivization, Sells et al. (1987) distinguish three kinds of transitivity: 1) c-structure transitivity – the reflexive is an independent constituent, 2) f-structure transitivity – the syntactic predicate selects an OBJ, 3) semantic transitivity – the referential identity of the arguments is accidental. Interestingly, German and Dutch simplex reflexives receive different analyses: they are both considered to be transitive in terms of c-structure, and intransitive in terms of semantics, but Sells et al. analyse the German reflexives as f-structurally intransitive, and the Dutch reflexives as f-structurally transitive. This is based upon the contrast in (66): the German reflexive can appear in an impersonal passive, whereas the non-reflexive counterpart is ruled out. The reflexive thus patterns with intransitives. The Dutch counterpart is not well-formed, which would suggest Dutch reflexives pattern with transitives.

- (66) a. German (Sells et al. 1987: §2.4, example 74)
 Jetzt wird {sich / *ihn} aber gewaschen!
 now is REFL him however washed
 ‘But now it is time to wash yourself!’
 Not: ‘...to wash him!’
- b. Dutch
 *Nu wordt (er) {zich / hem} gewassen!
 now is EXPL REFL him washed

Sells et al. (1987) model reflexives like (64a), (65a) with a lexical rule which maps a transitive verb (in all the three senses above) to a reflexive verb. For German, this involves leaving out the object slots, and marking the predicates with '[a] feature F, forcing them to combine with the reflexive element.'⁴¹ The resulting intransitive can then serve as input for the lexical rule for the impersonal passive. For Dutch, the reflexivization rule involves moving the thematic object to a non-thematic object slot, marked to be filled by a simplex reflexive.

The analysis of Sells et al. crucially relies on the use of lexical rules to take care of mapping. Modern LFG work would rely on a variant of LMT. Data like those in (66) then also receive a different status, as LMT does not model the (impersonal) passive as a rule to be applied on the output of another rule. Alencar & Kelling (2005) propose an analysis of the whole range of data in (64a–c) in terms of LMT, and explicitly reject the importance of the contrast in (66). Instead, they offer additional data to support the conclusion that the German reflexive *is* transitive at f-structure. Their LMT analysis of the data in (64), above, is summarized in (67).

- (67) a. rasieren/öffnen $\langle agent, theme \rangle$ ('shave'/'open', transitive)
 [-o] [-r]
 SUBJ OBJ
- b. (sich) rasieren $\langle agent_i, theme_i \rangle$ ('shave', reflexive of transitive)
 [-o] [-r]
 SUBJ_i OBJ_i[REFL]
- c. (sich) öffnen $\langle theme_i \rangle$ _i ('open', anticausative)
 [-r] [-r]
 SUBJ_i OBJ_i[REFL]
- d. (sich) schämen $\langle theme_i \rangle$ _i ('be ashamed', inherent reflexive)
 [-r] [-r]
 SUBJ_i OBJ_i[REFL]

In the last two cases, the reflexive is an expletive.⁴²

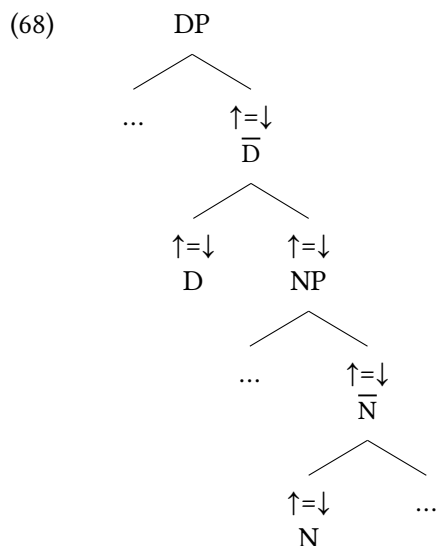
⁴¹The reflexive itself carries a constraining equation checking this feature F to make sure it is only combined with predicates that have undergone reflexivization. It is not spelled out in the article how the presence of the reflexive would be enforced technically, however. One solution is to let the verb and the reflexive be co-heads that check for the presence of each other using constraining equations.

⁴²The notation with indices to indicate reflexivity is taken from the paper. Note that, as they are also on expletives, these indices should not be interpreted as semantic co-reference.

3 LFG analyses in the nominal domain

3.1 Overall shape of nominal constituents

The CWG nominal domain has received a lot less attention than the clausal domain in LFG. The authors that have concerned themselves with the nominal domain in more detail all assume a DP analysis (Berman & Frank 1996, Part I, Chapter 3; Dipper 2003, Chapter 7; Strunk, 2004; 2005). The general shape of the nominal constituent is characterized by the familiar representation in (68).



In Spec-DP, elements like pre-determiners (Dutch: *al die mensen* ‘all those people’), pronominal genitives (that is, non-pronominal possessives; German: *Karls Auto* ‘Karl’s car’), and non-genitive pronominal possessors (Low Saxon: *de’n Jung sien Vadder*, lit. ‘the boy his father’) can occur. We refer to the discussion of possessives in Section 3.2.1 below for more elaborate examples. D holds determiners and pronouns, although Dipper (2003) assigns pronouns proper (in contrast to determiner-like pronouns) to a category Pron, which is the single daughter of \bar{D} .

The NP contains mostly lexical material. In Dipper (2003: Chapter 7, the theoretical discussion), the class of adjectival quantifiers (see Section 3.2.2, below) appears in Spec-NP, whereas other attributive adjectives appear as sisters to N. Berman & Frank (1996), however, assume that attributive adjectives are left-adjoined to NP (not shown in the schematic tree), whereas oblique and clausal complements are in Comp-NP, on the right.

This overall picture is slightly different in Dipper (2003: Chapter 8, the computational implementation) and Dipper (2005), which describe a flat DP/ \bar{D} , under which predeterminers, determiners, prenominal genitives and adjectival quantifiers (that is, the material in Spec-DP, D, and Spec-NP in 68 above) all appear as sisters of NP.⁴³

3.2 Topics in noun phrase syntax

3.2.1 Possessives in Low Saxon

Low Saxon has, amongst others, the range of possessive constructions illustrated in (69–71).

(69) Low Saxon (Strunk 2004: §2.2, examples 2.52 and 2.84)

- a. *sienen Weg*
his.M.SG.ACC way
'his way'
- b. *jeedeen Oort kreeg [sienen], [...].*
every kind got his.M.SG.ACC
'Every kind got its own, [...].'

(70) Low Saxon (Strunk 2004: §2.3, examples 2.112 and 2.177)

- a. *de'n Jung sien Vadder*
the.M.SG.ACC boy his.M.SG.NOM father
'the boy's father'
- b. *Korl sien*
Korl his.N.SG.NOM
'Korl's'

(71) (Strunk 2005: §6, example 61)

- [*Hinnerk=s Huss*] *iss groote den* [*Antje=s*].
Hinnerk=POSS house is bigger than Antje=POSS
Hinnerk's house is bigger than Antje's.

Example (69a) contains a possessive pronoun in combination with a noun expressing the possessum. The possessor is anaphorically given as the referent of

⁴³This analysis has the explicit goal of “serv[ing] as the base of a robust and efficient implementation” (Dipper 2005: 101), but its status as a theoretical claim remains a bit unclear. The question of whether a deeper/different analysis would have been preferred in a more theoretically oriented analysis and whether this flat structure should mostly be seen as an operationalization of a deeper structure, is unfortunately not discussed.

Berman & Frank (1996) and Dipper (2003) discuss the standard German prenominal genitive possessive construction, exemplified in (73a). In contrast to the clitic-in-D analysis given above for the (perhaps only superficially) similar Low Saxon possessive *-s*, these authors put the prenominal material completely in Spec-DP. Berman & Frank (1996) also treat the colloquial German possessive doubling construction, which involves a prenominal dative,⁴⁵ found in (73b). As in the analysis proposed for the Lower Saxon counterpart above, the (now dative-marked) possessor is located in Spec-DP, and the possessive pronoun in D.

- (73) German (Berman & Frank 1996: §3.1.2, example 136, 141)
- a. Peters (*das) Haus
Peter's the house
'Peter's house'
 - b. der Frau *(ihr) Haus
the.F.SG.ACC woman her house
'the woman's house'

In the analysis put forward by Berman & Frank, the main *structural* difference between the the German prenominal genitive and prenominal dative is that the former requires D to be empty (73a), whereas the latter requires D to be filled (73b). A binary feature on head realization is used to control this.

3.2.2 Declension and the status of quantifiers

Inside the German DP, determiners, adjectives and nouns show agreement with respect to gender, number and case. *Declension* is another agreement dimension, found between determiners and adjectives. Determiners have inherent declension: they can be categorized as inflected (strong declension), uninflected or mixed. In the latter case some cells are inflected/strong and others are not. Inflected adjectives, on the other hand, have strong (more distinctive morphology) and weak (less distinctive morphology) declension paradigms. Adjective declension agrees with the inherent declension of the determiner in the following way:

- (74) inflected (strong) determiner: weak adjective
uninflected or no determiner: strong adjective

⁴⁵Kasper (2014: 58–59) calls the prenominal dative possessive a “non-standard German [construction] that is completely absent from the standard but can be found in almost all regional varieties/ dialects”. Berman & Frank (1996) discuss the prenominal dative together with the prenominal genitive, and note that the former “allerdings eher in der gesprochenen Sprache auftritt” [is however more likely to occur in spoken language] (p. 59).

This phenomenon is illustrated in (75–76). For reasons of exposition, the inflection is made explicit and we use a zero morpheme to mark the lack of inflection. Note that *ein* is a member of the mixed declension class and appears both inflected (75b) and uninflected (76b).

(75) German (data from Dipper 2005: §3.2, presentation/glosses changed)

a. d-er süß-e rot-e Wein
 the-M.SG.NOM sweet-WEAK.SG.NOM red-WEAK.SG.NOM wine(M)

b. ein-em süß-en Wein
 a-M.SG.DAT sweet-WEAK.SG.DAT wine(M)

(76) a. süß-er rot-er Wein
 sweet-STRONG.M.SG.NOM red-STRONG.M.SG.NOM wine(M)

b. ein-∅ süß-er Wein
 a-M.SG.NOM sweet-STRONG.M.SG.NOM wine(M)

Determiners that do not inflect at all (for instance, *allerlei* ‘every kind’, *solcherlei* ‘such’) are not of the strong declension, and adjectives that do not inflect at all (*lila* ‘purple’, *rosa* ‘pink’) are ambiguous between strong/weak declension.

Dipper (2005) models the facts about declension in the following way: The f-structure projected from the DP has a feature DECL, whose value is equated with ST-DET in strong determiners and with ST-ADJ in strong adjectives. This captures the fact that these two are never seen together. Weak adjectives constrain their containing DP’s f-structure by $DECL =_c$ ST-DET, and therefore only co-occur with strong determiners. Uninflected adjectives and determiners do not constrain the DECL feature at all.

As seen in (75a) and (76a), when the DP/NP contains multiple adjectives, they show identical declension. Dipper (2005) uses this fact to address the issue of the categorial status of quantifiers like *alle* ‘all’ and *mehrere* ‘multiple’, for which it is difficult to decide whether they are determiners or adjectives. By inspecting the declension of adjectival material in the presence of a quantifier, Dipper is able to clearly distinguish determiner-like and adjective-like quantifiers.

3.2.3 Preposition-determiner contractions

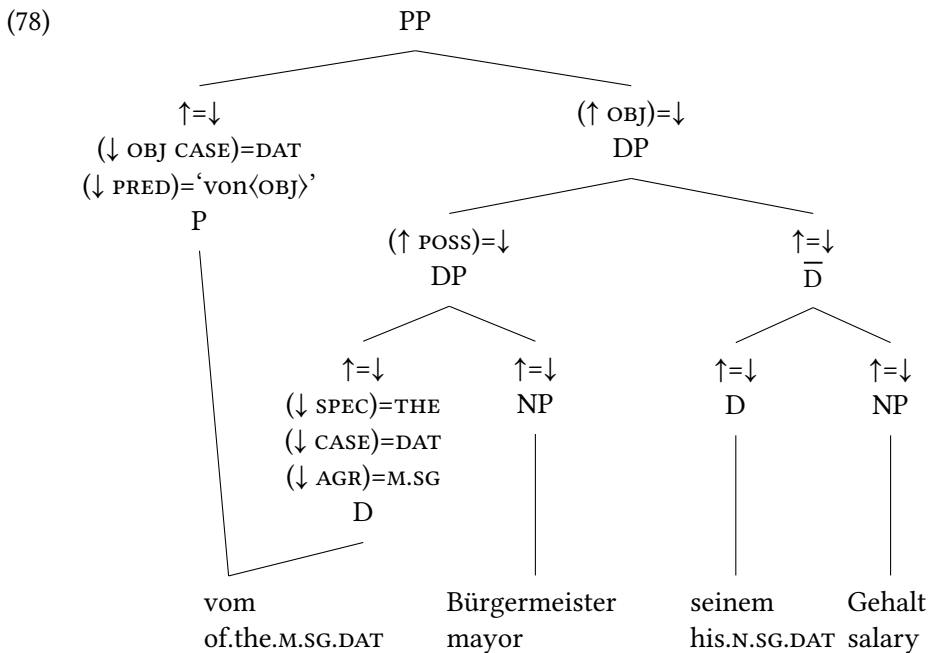
German has a number of lexical preposition-determiner (P-D) contractions, such as *zum* ‘to the’, and *vom* ‘of the’, shown in (77).

(77) a. zum König
 to.the.M.SG.DAT king
 ‘to the king’

- b. vom Bürgermeister seinem Gehalt
of.the.M.SG.DAT mayor his.N.SG.DAT salary
‘of the mayor’s salary’

In Berman & Frank (1996), P-D contractions are treated as prepositions that not only constrain their object DP in a P-like manner – it must have a given case – but also in a D-like manner – it is marked definite and has certain agreement features. Most importantly, the object DP may not itself realize its own D. This is enforced using the binary head realization feature also used in the analysis of possessives, sketched in Section 3.2.1 above.

The example in (77b) shows that this picture is too simplistic: here, the D-like properties do not constrain the object DP, but the prenominal dative of this DP. It is inside this prenominal dative that D is left unrealized, and not in the object DP itself, which has *seinem* in D. The correct generalization about P-D contractions must therefore include that the D inherent in the contraction corresponds to a D leftmost in the object DP, and need not be the object DP’s head. Wescoat (2007) gives an analysis in terms of lexical sharing that addresses exactly these points. In Wescoat’s lexical sharing model, one lexical terminal can correspond to multiple adjacent preterminals. A slightly simplified analysis of (77b) is given in (78).



The fact that the preterminals projected from *vom* need to be adjacent solves the problem noted above that the generalization about P-D contractions needs to include reference to the left edge of the object DP. In the paper, Wescot describes further constraints on the function of the projected D inside the object DP.

3.2.4 Indeterminacy of case

The German nominal inflection paradigms show pervasive syncretism. These syncretic forms can either be ambiguous or indeterminate. Ambiguous forms can be used in different contexts, but they can only be in one paradigmatic cell at a time. So *sie* in (79), which in isolation is ambiguous between plural ‘they’ and feminine singular ‘she’, can be used in either way (79a,b), but not as both at once (79c). Indeterminate forms *can* function as if they are in different cells simultaneously. For instance, *Papageien* ‘parrots’, which is indeterminate for case, can at the same time be selected as an accusative object and a dative object (80).

- (79) a. Sie hilft Papageien.
she helps parrots
b. Sie helfen Papageien.
they help parrots
c. * Sie hilft und helfen Papageien.
- (80) a. Sie hilft Papageien.
she helps parrots.DAT
b. Sie findet Papageien.
she finds parrots.ACC
c. Sie findet und hilft Papageien.

Although a simple disjunctive defining equation for a feature suffices for the ambiguous cases, this is not enough to achieve indeterminacy, since a disjunction does not change the fact that a feature can only have one value at a time. Dalrymple et al. (2009) represent indeterminate features as bundles of binary features, one for each of the values in the paradigmatic dimension. Compatibility with values is given as a disjunction of *positive* specifications, incompatibility as *negative* specifications. Two example lexical specifications are given in (81).

- (81) a. *Papageien* (\uparrow CASE {NOM|GEN|DAT|ACC}) = +
b. *Männer* (\uparrow CASE {NOM|GEN|ACC}) = +
(\uparrow CASE DAT) = –

These specifications state that *Papageien* is completely indeterminate with respect to case (81a), whereas *Männer* is non-dative, but otherwise indeterminate with respect to case (81b).

A selecting element then expresses its case requirements in positive terms only. The entries in (82) illustrate this.

- (82) a. *hilft*⁴⁶ (↑ OBJ CASE DAT) = +
 b. *findet* (↑ OBJ CASE ACC) = +

Since the case feature bundles for *Papageien* defined in (81a) can satisfy both these requirements at the same time, we can capture the coordination of (80c). Dalrymple et al. show that this approach can also deal with additional material in the DP like adjectives, which further constrain the case value, and with verbs which themselves are indeterminate about their case requirements on selected arguments.

4 Concluding remarks

This chapter has presented an overview of Lexical-Functional Grammar studies of Continental West Germanic languages. The majority of the work discussed here has dealt with German clausal syntax, followed by discussions of Dutch clausal syntax. This reflects the status of the LFG field as a whole – the nominal domain has received a lot less attention than the clausal/verbal domain, see Börjars & Lowe forthcoming [this volume] – but it also reflects the fact that the other CWG languages – possibly, but not only, minority, regional, and/or non-standardized languages – do not feature prominently in the LFG literature. I hope that the discussion of existing work on the syntax of the two “big” CWG languages in the current chapter may inspire further application of LFG to the other members of the family.

Obviously, not every LFG study that touches upon CWG has been mentioned in this chapter. There are some larger blind-spots that I wish to mention here.

- Bögel (2015) develops an LFG model of the prosody-syntax interface. Recent papers contain applications to Swabian (Bögel & Raach 2020; Bögel 2021) and Standard German (Bögel 2020). See also Bögel forthcoming [this volume].

⁴⁶We follow here the presentation in the paper and gloss over the fact that *helfen* ‘help’ might be better analysed as taking an OBJ_θ rather than an OBJ, which would complicate modelling the coordination.

- A number of authors have used OT in combination with LFG, especially in the domain of word order variation and information structure. Examples are Choi (1999, 2001), Cook (2001), Cook & Payne (2006), Van der Beek (2005), and Seiler (2007). These have been mentioned in the text, but were not discussed in any detail. OT-LFG is dealt with in Kuhn forthcoming [this volume], and information structure is treated in Zaenen forthcoming [this volume].
- German is blessed with a wide-coverage LFG grammar, implemented in the context of the ParGram project. This grammar can be queried in the interactive XLE-WEB interface.⁴⁷ The project page for the ParGram project in Germany,⁴⁸ contains older references. The research activities in and around this project have resulted in a long list of publications. Some of that work has already been discussed above. I will here list a small selection of further papers that also have direct relevance for theoretical debates: Forst & Rohrer (2009) and Kuhn et al. (2010) discuss problems in the analysis of German VP coordination; Rehbein & van Genabith (2006) and Forst et al. (2010) deal with the implementation of particle verbs; Forst (2006) is a “grammar writer’s” contribution to the COMP-debate. The desire for parallel structures in the context of ParGram is one of the forces behind the auxiliaries-as-features style of syntactic analysis in LFG. An early contribution and implementation can be found in Butt et al. (1996). Computational work on LFG is the topic of several chapters in Part V of this volume.

Omitting these studies from the main text was a conscious choice, intended to keep the chapter accessible by not introducing too much conceptual machinery and too many problem domains. I made this choice with the knowledge that their topics would be touched upon in other chapters. At the same time, I wish to underline their importance, because exactly the fact that they span multiple domains and methods means that they are excellent demonstrations of the flexibility and precision that LFG offers.

Acknowledgements

I thank Bozhil Hristov and two anonymous reviewers for the detailed and valuable comments that greatly helped to improve this chapter. Moreover, I am grate-

⁴⁷<https://clarino.uib.no/iness/xle-web>, consulted July 2022

⁴⁸<https://www.ims.uni-stuttgart.de/en/research/projects/pargram>, consulted July 2022

ful to Mary Dalrymple for editing this volume, inviting me to contribute, and her extraordinary patience during the writing process.

Abbreviations

Besides the abbreviations from the Leipzig Glossing Conventions, this chapter uses the following abbreviations.

| | | | |
|------|---------------------------|-------|---|
| CWG | Continental West Germanic | OT | Optimality Theory |
| EXPL | expletive | rb | right bracket |
| IPP | infinitivus participio | TEINF | (Dutch) infinitive with marker <i>te</i> |
| lb | left bracket | Vf | Vorfeld |
| Mf | Mittelfeld | ZUINF | (German) infinitive with marker <i>zu</i> |
| Nf | Nachfeld | | |

References

- Alencar, Leonel F. de & Carmen Kelling. 2005. Are reflexive constructions transitive or intransitive? Evidence from German and Romance. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG '05 conference*, 1–20. Stanford: CSLI Publications.
- Andersen, Christiane. 2016. Syntax in contact. Word order in a contact variety of German spoken in Eastern Siberia. *Journal of Language Contact* 9(2). 264–292. DOI: 10.1163/19552629-00902003.
- Bech, Gunnar. 1955/7. *Studien über das deutsche verbum infinitum*. Copenhagen: Det Kongelige Danske Videnskabernes Selskab.
- Berman, Judith. 2003. *Clausal syntax of German*. Stanford: CSLI Publications.
- Berman, Judith, Stefanie Dipper, Christian Fortmann & Jonas Kuhn. 1998. Argument clauses and correlative ‘es’ in German – Deriving discourse properties in a unification analysis. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG '98 conference*. Stanford: CSLI Publications.
- Berman, Judith & Anette Frank. 1996. *Deutsche und Französische Syntax im Formalismus der LFG* (Linguistische Arbeiten 344). Tübingen: Niemeyer. DOI: 10.1515/9783110955354.
- Biberauer, Theresa. 2009. How “well-behaved” is Afrikaans? V2 in Modern Spoken Afrikaans. In Hans den Besten, Frans Hinskens & Jerzy Koch (eds.), *Afrikaans: Een drieluik*, 176–208. Amsterdam/Münster: Stichting Neerlandistiek VU/Nodus Publikationen.

- Bögel, Tina. 2015. *The syntax-prosody interface in Lexical Functional Grammar*. Konstanz: University of Konstanz. (Doctoral dissertation).
- Bögel, Tina. 2020. German case ambiguities at the interface: Production and comprehension. In Gerrit Kentner & Joost Kremers (eds.), *Prosody in syntactic encoding* (Linguistische Arbeiten 573), 51–84. Berlin: De Gruyter.
- Bögel, Tina. 2021. Function words at the interface: A two-tier approach. *Languages* 6(4). DOI: 10.3390/languages6040197.
- Bögel, Tina. Forthcoming. Prosody and its interfaces. In Mary Dalrymple (ed.), *Handbook of Lexical Functional Grammar*. Berlin: Language Science Press.
- Bögel, Tina & Lea Raach. 2020. Swabian *ed* and *edda*: Negation at the interfaces. In Miriam Butt & Ida Toivonen (eds.), *Proceedings of the LFG '20 conference*, 47–67. Stanford: CSLI Publications.
- Börjars, Kersti & John J. Lowe. Forthcoming. Noun phrases in LFG. In Mary Dalrymple (ed.), *Handbook of Lexical Functional Grammar*. Berlin: Language Science Press.
- Bresnan, Joan. 1998. Morphology competes with syntax: Explaining typological variation in weak crossover effects. In Pilar Barbosa, Danny Fox, Paul Hagstrom, Martha McGinnis & David Pesetsky (eds.), *Is the best good enough? Optimality and competition in syntax*, 59–92. Cambridge, MA: The MIT Press & MITWPL.
- Bresnan, Joan, Ash Asudeh, Ida Toivonen & Stephen Wechsler. 2016. *Lexical-Functional Syntax*. 2nd edn. (Blackwell Textbooks in Linguistics 16). Malden, MA: Wiley-Blackwell.
- Bresnan, Joan, Ronald M. Kaplan, Stanley Peters & Annie Zaenen. 1982. Cross-serial dependencies in Dutch. *Linguistic Inquiry* 13(4). 613–635. <https://www.jstor.org/stable/4178298>. Reprinted in Savitch, Bach, Marsh & Safran-Naveh (1987: 286–319).
- Butt, Miriam, Christian Fortmann & Christian Rohrer. 1996. Syntactic analyses for parallel grammars: Auxiliaries and genitive NPs. In *COLING '96: Proceedings of the 16th Conference on Computational Linguistics*, 182–187. Copenhagen: International Committee on Computational Linguistics. DOI: 10.3115/992628.992662.
- Choi, Hye-Won. 1995. Weak crossover in scrambling languages: Precedence, rank and discourse. Paper delivered at the 69th Annual Meeting of the Linguistic Society of America, New Orleans, LA. https://www.linguisticsociety.org/sites/default/files/1995_searchable.pdf.
- Choi, Hye-Won. 1999. *Optimizing structure in context: Scrambling and information structure*. Stanford: CSLI Publications.

- Choi, Hye-Won. 2001. Phrase structure, information structure and resolution of mismatches. In Peter Sells (ed.), *Formal and empirical issues in Optimality Theoretic Syntax*, 17–62. Stanford: CSLI Publications.
- Clément, Lionel, Kim Gerdes & Sylvain Kahane. 2002. An LFG-type grammar for German based on the topological model. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG '02 conference*. Stanford: CSLI Publications.
- Cook, Philippa. 2001. *Coherence in German: An information structure approach*. (Revised version). University of Manchester. (Doctoral dissertation).
- Cook, Philippa. 2006. The datives that aren't born equal: Beneficiaries and the dative passive. In Daniel Hole, André Meinunger & Werner Abraham (eds.), *Between argument structure and event structure* (Studies in Language Companion Series 75), 141–184. Amsterdam/Philadelphia: John Benjamins. DOI: 10.1075/slcs.75.08coo.
- Cook, Philippa & John R. Payne. 2006. Information structure and scope in German. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG '06 conference*, 124–144. Stanford: CSLI Publications.
- Coussé, Evie & Gerlof Bouma. 2022. Semantic scope restrictions in complex verb constructions in Dutch. *Linguistics* 60(1). 123–176. DOI: 10.1515/ling-2021-0172.
- Dalrymple, Mary. 2001. *Lexical Functional Grammar* (Syntax and Semantics 34). New York: Academic Press. DOI: 10.1163/9781849500104.
- Dalrymple, Mary, Ronald M. Kaplan, John T. Maxwell III & Annie Zaenen (eds.). 1995. *Formal issues in Lexical-Functional Grammar*. Stanford: CSLI Publications.
- Dalrymple, Mary, Ronald R. Kaplan & Tracy Holloway King. 2001. Weak crossover and the absence of traces. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG '01 conference*. Stanford: CSLI Publications.
- Dalrymple, Mary, Tracy Holloway King & Louisa Sadler. 2009. Indeterminacy by underspecification. *Journal of Linguistics* 45. 31–68. DOI: 10.1017/S0022226708005513.
- Diesing, Molly. 1997. Yiddish VP order and the typology of object movement in Germanic. *Natural Language & Linguistic Theory* 15(2). 369–427. DOI: 10.1023/A:1005778326537.
- Dipper, Stefanie. 2003. Implementing and documenting large-scale grammars – German LFG. *Arbeitspapiere des Instituts für Maschinelle Sprachverarbeitung (AIMS)* 9(1).
- Dipper, Stefanie. 2005. German quantifiers: Determiners or adjectives? In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG '05 conference*, 100–115. Stanford: CSLI Publications.

- Dowty, David R. 1991. Thematic proto-roles and argument selection. *Language* 67. 547–619. DOI: 10.2307/415037.
- Eberhard, David M., Gary F. Simons & Charles D. Fennig (eds.). 2019. *Ethnologue: Languages of the world*. 22nd edn. Dallas: SIL International.
- Evers, Arnold. 1975. *The transformational cycle in Dutch and German*. Rijksuniversiteit Utrecht. (Doctoral dissertation).
- Eythórsson, Thórhallur & Jóhanna Barðdal. 2005. Oblique subjects: A common Germanic inheritance. *Language* 81(4). 824–881.
- Findlay, Jamie Y. & Anna Kibort. Forthcoming. Argument structure and mapping theory. In Mary Dalrymple (ed.), *Handbook of Lexical Functional Grammar*. Berlin: Language Science Press.
- Forst, Martin. 2006. COMP in (parallel) grammar writing. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG '06 conference*, 222–239. Stanford: CSLI Publications.
- Forst, Martin, Tracy Holloway King & Tibor Laczkó. 2010. Particle verbs in computational LFGs: Issues from English, German, and Hungarian. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG '10 conference*, 228–248. Stanford: CSLI Publications.
- Forst, Martin & Christian Rohrer. 2009. Problems of German VP coordination. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG '09 conference*. Stanford: CSLI Publications.
- Fortmann, Christian. 2006. The complement of *verba dicendi* parentheticals. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG '06 conference*. Stanford: CSLI Publications.
- Frank, Anette. 2006. A (discourse-)functional analysis of asymmetric coordination. In Miriam Butt, Mary Dalrymple & Tracy Holloway King (eds.), *Intelligent linguistic architectures: Variations on themes by Ronald M. Kaplan*, 259–286. Stanford: CSLI Publications.
- Haeseryn, Walter (ed.). 1997. *Algemene Nederlandse spraakkunst*. 2nd edn. Groningen: Nijhoff.
- Haider, Hubert. 2010. *The syntax of German* (Cambridge Syntax Guides). Cambridge, UK: Cambridge University Press. DOI: 10.1017/CBO9780511845314.
- Haider, Hubert & Inger Rosengren. 2003. Scrambling: Nontriggered chain formation in OV languages. *Journal of Germanic Linguistics* 15(3). 203–267. DOI: 10.1017/S1470542703000291.
- Hammarström, Harald, Robert Forkel & Martin Haspelmath (eds.). 2019. *Glottolog 4.1*. Jena: Max Planck Institute for the Science of Human History. DOI: 10.5281/zenodo.3554959. <https://glottolog.org>.

- Jones, Stephen. 2020. Multifunctional Dutch ‘er’. In Miriam Butt & Ida Toivonen (eds.), *Proceedings of the LFG ’20 conference*. Stanford: CSLI Publications.
- Kaplan, Ronald M. & Annie Zaenen. 2003. West-Germanic verb clusters in LFG. In Pieter A. M. Seuren & Gerard Kempen (eds.), *Verb constructions in German and Dutch*, 127–150. Amsterdam: John Benjamins. DOI: 10.1075/cilt.242.05kap.
- Kaplan, Ronald M. & Annie Zaenen. Forthcoming. Long-distance dependencies. In Mary Dalrymple (ed.), *Handbook of Lexical Functional Grammar*. Berlin: Language Science Press.
- Kasper, Simon. 2014. Linking syntax and semantics of adnominal possession in the history of German. In Chiara Gianollo, Agnes Jäger & Doris Penka (eds.), *Language change at the syntax-semantics interface*, 57–100. Berlin, Munich, Boston: De Gruyter Mouton. DOI: 10.1515/9783110352306.57.
- Kordoni, Valia. 2003. Valence alternations in German: An LMT analysis. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG ’03 conference*, 250–268. Stanford: CSLI Publications.
- Kuhn, Jonas. 2001. Resource sensitivity in the syntax-semantics interface: Evidence from the German split NP construction. In W. Detmar Meurers & Tibor Kiss (eds.), *Constraint-based approaches to Germanic syntax* (Studies in Constraint-Based Lexicalism), 177–216. Stanford: CSLI Publications.
- Kuhn, Jonas. Forthcoming. LFG, Optimality Theory and learnability of languages. In Mary Dalrymple (ed.), *Handbook of Lexical Functional Grammar*. Berlin: Language Science Press.
- Kuhn, Jonas, Christian Rohrer & Sina Zarrieß. 2010. Right node raising in parsing and generation. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG ’10 conference*. Stanford: CSLI Publications.
- Lee-Schoenfeld, Vera. 2007. *Beyond coherence: The syntax of opacity in German*. Vol. 114 (Linguistik Aktuell). Amsterdam: John Benjamins. DOI: 10.1075/la.114.
- Maling, Joan & Annie Zaenen (eds.). 1990. *Modern Icelandic syntax* (Syntax and Semantics 24). San Diego, CA: Academic Press. DOI: 10.1163/9789004373235.
- Meinunger, André. 2007. About object ‘es’ in the German *Vorfeld*. *Linguistic Inquiry* 38(3). 553–563. DOI: 10.1162/ling.2007.38.3.553.
- Müller, Stefan, Felix Bildhauer & Philippa Cook. 2012. Beschränkungen für die scheinbar mehrfache Vorfeldbesetzung im Deutschen. In Colette Cortès (ed.), *Satzeröffnung. Formen, Funktionen, Strategien*, 113–128. Tübingen: Stauffenburg.
- Netter, Klaus. 1988. Non-local dependencies and infinitival constructions in German. In Uwe Reyle & Christian Rohrer (eds.), *Natural language parsing and linguistic theories* (Studies in Linguistics and Philosophy 35), 356–411. Dordrecht: Reidel. DOI: 10.1007/978-94-009-1337-0_13.

- Poortvliet, Marjolein. 2015. An LFG approach to nested dependencies in Dutch. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG '15 conference*. Stanford: CSLI Publications.
- Pullum, Geoffrey K. & Gerald Gazdar. 1982. Natural languages and context-free languages. *Linguistics and Philosophy* 4. 471–504. DOI: 10.1007/bf00360802.
- Putnam, Michael (ed.). 2011. *Studies on German-language islands* (Studies in Language Companion 123). Amsterdam: John Benjamins. DOI: 10.1075/slcs.123.
- Rehbein, Ines & Josef van Genabith. 2006. German particle verbs and pleonastic prepositions. In *Proceedings of the third ACL-SIGSEM workshop on prepositions*. DOI: 10.3115/1621431.1621440.
- Reis, Marga. 1996. Extraction from verb-second clauses in German? In Uli Lutz & Jürgen Pafel (eds.), *On extraction and extraposition in German*, 45–88. Amsterdam: John Benjamins. DOI: 10.1075/la.11.03rei.
- Rohrer, Christian. 1996. Fakultativ kohärente Infinitivkonstruktionen im Deutschen und deren Behandlung in der Lexikalisch Funktionalen Grammatik. In Gisela Harra & Manfred Bierwisch (eds.), *Wenn die Semantik arbeitet*, 89–108. Mouton de Gruyter. DOI: 10.1515/9783110919899.89.
- Santorini, Beatrice. 1992. Variation and change in Yiddish subordinate clause word order. *Natural Language & Linguistic Theory* 10(4). 595–640. DOI: 10.1007/bf00133331.
- Savitch, Walter J., Emmon Bach, William Marsh & Gila Safran-Naveh (eds.). 1987. *The formal complexity of natural language* (Studies in Linguistics and Philosophy). Dordrecht: Springer.
- Seiler, Guido. 2007. Microvariation in LFG and OT. In Annie Zaenen, Jane Simpson, Tracy Holloway King, Jane Grimshaw, Joan Maling & Chris Manning (eds.), *Architectures, rules, and preferences: Variations on themes by Joan W. Bresnan*, 529–547. Stanford: CSLI Publications.
- Sells, Peter, Annie Zaenen & Draga Zec. 1987. Reflexivization variation: Relations between syntax, semantics, and lexical structure. In Masayo Iida, Stephen Wechsler & Draga Zec (eds.), *Working papers in grammatical theory and discourse structure, volume 1: Interactions of morphology, syntax, and discourse* (CSLI Lecture Notes 11), 169–238. Stanford: CSLI Publications.
- Shieber, Stuart M. 1985. Evidence against the context-freeness of natural language. *Linguistics and Philosophy* 8(3). 333–343. DOI: 10.1007/978-94-009-3401-6_12.
- Strunk, Jan. 2004. *Possessive constructions in Modern Low Saxon*. Stanford: Stanford University. (MA thesis).

- Strunk, Jan. 2005. Pro-drop in nominal possessive constructions. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG '05 conference*, 447–467. Stanford: CSLI Publications.
- Theiler, Nadine & Gerlof Bouma. 2012. Two for the price of one: An LFG treatment of sentence initial object *es* in German. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG '12 conference*. Stanford: CSLI Publications.
- van der Beek, Leonoor. 2005. *Topics in corpus-based Dutch syntax*. University of Groningen. (Doctoral dissertation). <https://research.rug.nl/nl/publications/topics-in-corpus-based-dutch-syntax>.
- Wescoat, Michael T. 2007. Preposition-determiner contractions: An analysis in Optimality-Theoretic Lexical-Functional Grammar with lexical sharing. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG '07 conference*, 439–459. Stanford: CSLI Publications.
- Wurmbrand, Susi. 2004. West Germanic verb clusters: The empirical domain. In Katalin É. Kiss & Henk van Riemsdijk (eds.), *Verb clusters: A study of Hungarian, German, and Dutch* (Linguistics Today 69), 43–85. Amsterdam: John Benjamins. DOI: 10.1075/la.69.05wur.
- Zaenen, Annie. 1989. *The place of bevalen (please) in the syntax of Dutch*. Tech. rep. SSL-89-17. System Sciences Laboratory, Palo Alto Research Center. <https://web.stanford.edu/~azaenen/publications/Bevalen.pdf>.
- Zaenen, Annie. 1993. Unaccusativity in Dutch: Integrating syntax and lexical semantics. In James Pustejovsky (ed.), *Semantics and the lexicon*, 129–161. Dordrecht: Kluwer Academic Publishers. DOI: 10.1007/978-94-011-1972-6_9.
- Zaenen, Annie. 1996. Contrastive dislocation in Dutch and Icelandic. In Elena Anagnostopoulou, Henk van Riemsdijk & Frans Zwarts (eds.), *Materials on left dislocation*. Amsterdam: John Benjamins. DOI: 10.1075/la.14.09zae.
- Zaenen, Annie. Forthcoming. Information structure. In Mary Dalrymple (ed.), *Handbook of Lexical Functional Grammar*. Berlin: Language Science Press.
- Zaenen, Annie & Ronald M. Kaplan. 1995. Formal devices for linguistic generalizations: West Germanic word order in LFG. In Jennifer S. Cole, Georgia M. Green & Jerry L. Morgan (eds.), *Linguistics and computation*, 3–27. Stanford: CSLI Publications. Reprinted in Dalrymple, Kaplan, Maxwell & Zaenen (1995: 215–240).
- Zaenen, Annie & Ronald M. Kaplan. 2002. Subsumption and equality: German partial fronting in LFG. In Miriam Butt & Tracy Holloway King (eds.), *Proceedings of the LFG '02 conference*, 409–426. Stanford: CSLI Publications.
- Zaenen, Annie, Joan Maling & Höskuldur Thráinsson. 1985. Case and grammatical functions: The Icelandic passive. *Natural Language & Linguistic Theory*

3(4). 441–483. DOI: 10.1007/bf00133285. Reprinted in Maling & Zaenen (1990: 95–136).

Zifonun, Gisela, Ludger Hoffmann & Bruno Strecker. 1997. *Grammatik der deutschen Sprache*. Vol. 7 (Schriften des Instituts für deutsche Sprache). Berlin: Walter de Gruyter. DOI: 10.1515/9783110872163.

Zwart, Jan-Wouter. 2008. Continental West-Germanic languages. In Guglielmo Cinque & Richard S. Kayne (eds.), *The Oxford handbook of comparative syntax*. Oxford: Oxford University Press. DOI: 10.1093/oxfordhb/9780195136517.013.0021.